THE SOCIAL GEOGRAPHY OF HANDICAP

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Declaration

I declare that no portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other University or institution of learning, and that the work presented is solely my own.

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Abstract

The thesis began by describing the difference between disability and handicap, and how they had been classified and measured in the past. The important role society has in creating handicaps for people was discussed. The relevance of medical-social geography to the study of disability and handicap was shown, and information presented demonstrating that spatial patterns existed among the disabled at scales ranging from regions to electoral wards.

The literature was reviewed to establish potential causes for much spatial patterning, and a three factor model was supported. The model involved spatial differences in "generative factors" (causing higher prevalence of disabling disease), "intervention factors" (differing levels of health or personal support services) and "redistributive factors" (socio-economic forces acting to segregate people when handicapped). Nine hypotheses were generated setting out the way these factors would operate.

Data from a full household survey of the disabled in the London Borough of Barnet were presented, the spatial distribution, disorders and difficulties of those interviewed being described. An ecological analysis approach was used to test the hypotheses in the Barnet context, 65.3% of the variance in patterns of disability prevalence being explained by three variables; age, housing tenure and sheltered housing status.

The concept of territorial justice was subsequently investigated, patterns of expressed need for a range of services being compared to actual provision. Some significant deviations from a just distribution were identified.

In conclusion the thesis argued for an extension of current definitions of medical geography to encompass the situation of, and support for, those with long-term disabilities. The thesis supported the view that traditional as well as contemporary approaches are required if we are to fully understand patterns of disease and its consequences.

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I THE NATURE OF HANDICAP

CHAPTER 1

THE NATURE OF IMPAIRMENT, DISABILITY AND HANDICAP

1.1 Introduction

Disability and handicap are major features of our society in Great Britain as well as in the rest of the western world. Estimates of the number of people suffering appreciable levels of disability range from 1.1 million to 3 million (Walker and Townsend,1981;pp3-4). With the "rising tide" of elderly people in our society, and the fact that the elderly make up the majority of the disabled, the number of disabled people are increasing as a proportion of our population. Over the last twenty years we have provided an increased amount of support to disabled people, both in terms of financial support and in terms of practical personal support. Between 1970 and 1979, central government expenditure on services for the disabled rose from £10.5 million to £48.3 million, and expenditure on welfare benefits rose from £151 million to £1574 million (Guthrie,1980;tables 10.1,10.2,pp 226). At the same time expenditure services provided by local authorities in England and Wales to the disabled such as personal aids, home adaptations, home help services and help with telephones was also rising. By 1978 these local authorities were spending £120.8 million on home helps, £6.7 million on aids and adaptations, and £3.1 million on telephones. In addition to central and local government support, district health authorities also provide considerable service input to disabled people. This takes the form of direct medical care in the community by doctors and nurses, rehabilitation services through paramedical services such as physiotherapy, and in direct residential care in hospitals or special units.

With a relatively large disabled population, and a network of support services split between many different agencies, there is considerable potential for spatial differences in levels of disability and in levels of support. Disability as a human phenomenon has, however, not received the attention of geographers in the past that it may have deserved. We shall see that, while historically much work has been carried out by geographers in looking at the relationship between environment and disease, this has concentrated in the main on infective processes rather than on the environmental roots of chronic disease. There is still a great deal of work to be done on describing patterns of disabling disease, and the patterns of disability that result at a number of spatial scales. In looking at the processes that relate environmental characteristics and disabling disease, a case will be made in this Thesis for more emphasis to be placed on the social environment than may have been the case in the past.

As we have seen, support to the disabled from statutory services takes up a very significant level of national resources. The fact that these services are controlled by both local and central authorities, means that there is a potential for priorities and policies to vary across space. Disabled people rely on their support services for the very quality of their lives, and there is no area of service provision where a territorially just response to patterns of need is more important. An argument is put forward here that a geographical approach to disability needs to take into account the spatial aspects of service response as well as disease and environment relationships if we are to adequately understand the patterns we observe. It is also suggested that the study of the geography of disability and handicap can contribute to a "holistic" view of medical-social geography in which the contemporary relevance of what have, historically, been a very broad range of approaches to the geography of health can be better understood.

This research study is presented in three parts covering the following areas:

The Nature of Disability and Handicap
Factors Determining Spatial Variations in Disability and Handicap
The Geography of Disability and Handicap in a London Borough

Under the heading "The Nature of Disability and Handicap", this chapter continues by examining what is meant by terms such as "Impairment", "Disability" and "Handicap", and what approaches have been used to classify and measure their presence in the community. The Chapter ends with a review of the different approaches that have been used within Medical-Social Geography, and a discussion of their possible relevance for the study of the multi-dimensional phenomenon that is "handicap". Chapter 2 goes on to look at the evidence for the existence of spatial patterns in prevalence of disability, and the characteristics of the disabled population in Great Britain. Chapter 3 presents some of the evidence showing differences in spatial patterns of service provision to the disabled. It suggests that these differences do not reflect patterns of need, and that this disparity represents a pattern of net handicap among those effected.

The second part of the Thesis is headed "Factors Determining Spatial Variations in Disability and Handicap" and presents the literature on the factors that may produce patterns of disability prevalence. This is organised into three chapters. Chapter 4 presents arguments for the influence of the environment, in a broad sense, on disability. Chapter 5 goes on to look at the influence of people's basic characteristics on the

prevalence of disability (age, social class etc.), while Chapter 6 looks at the effect onset of disability has on subsequent locational behaviour and spatial patterning. Chapter 6 also presents a general model to explain patterns of disability.

The third and final part of the Thesis is headed "The Geography of Disability and Handicap in a London Borough" and presents data from a 100% household survey of disabled people in the London Borough of Barnet. Chapter 7 describes the survey itself, and presents data on the characteristics of the disabled population concerned, and the disorders and disabilities they experience. Spatial patterns of disease and disability are presented. Chapter 8 contains a discussion of limitations in some approaches to spatial analysis, and makes a case for more work in an "ecological study" tradition. The chapter then describes the social and demographic context of the area, and uses the ecological study approach to test the relevance of the various parts of the model generated previously in explaining patterns of disability in Barnet. Chapter 9 looks at the relationship between expressed need for services in the Borough and levels of provision to the individuals concerned, and discusses the implications for territorial justice and for patterns of "handicap" in the area. Finally Chapter 10 summarises the findings of the Thesis, and comments on the significance of the results for social and medical geography, and for policy towards disabled people.

1.2 Definitions of Impairment, Disability and Handicap

We all have a set of images that describe what it is like to be disabled or handicapped. These images may have been influenced by appeals on behalf of handicapped people by charities both on radio and television. They may have been influenced by advertising posters highlighting the needs of particular groups of disabled or chronically sick, or by newspaper articles on individual cases of hardship or success. Less frequently our images may be formed from personal experience or close contact with handicapped people. These images are rarely based on a conscious or systematic definition of terms such as "handicapped","disabled" or "impaired." They remain however, fundamental to our attitudes towards, and our social interaction with handicapped people.

In a similar way there exist institutional images of people with handicaps and disabilities, these images created from rules of eligibility for particular welfare benefits or services. These benefits and services have expanded over the years to provide a wide ranging and essential support network for disabled people. They include direct care services from the National Health Service and Local Authority Social Services Departments, advice and care services run by many charitable and

voluntary organisations, and financial benefits from central government through the Department of Health and Social Security. In addition the Department of Employment offer an advice and placement service for prospective disabled workers through Disabled Resettlement Officers and ensure access in theory, to 3% of all jobs in firms employing twenty or more workers, known as the Quota Scheme.

The access of handicapped people to these resources is dependent not only on institutional rules of eligibility but is further complicated by the images of them shared by the administrative and the professional groups who control and operate the services. All of the many support systems mentioned and professional workers within them operate through definitions of clients that rely more on the historical development of the institution than on a systematic criteria for defining or measuring handicap or disability (Blaxter,1976). Definition, terminology and measurement are not therefore, merely matters of academic concern but of crucial importance for the well-being of many disadvantaged people. Falling within an official definition of disability can open the door for an individual to many desperately needed resources. Being labelled "disabled" by society could also leave a person isolated in the community, with little hope of employment or personal independence. This chapter deals firstly with the definitions, classification systems and measurement scales developed by academics and the medical profession to describe impairment, disability and handicap. It goes on to look at the emphasis others have placed on the role of society, and of service systems in the creation of handicap as a state, from a situation in which an individual has a physical or mental impairment.

The growth of interest among academics in definitional problems associated with disablement comes from the changing health situation in western society (Bury,1979a;Giggs,1977). During the nineteenth and twentieth centuries the reduction in death from infectious disease has lead to an increasingly elderly population in the west. This, combined with an increase in numbers suffering chronic conditions now associated with the western way of life, has focused attention on the care and treatment of those with long-term physically disabling conditions (Taylor,1981). Clarke and Clarke (1975) have indicated that those with milder forms of mental subnormality only come to notice when the complexity of society advances beyond the limit of their competence. Over the same period that interest has shifted towards chronic rather than acute physical disorders, there has been increasing concern in the west with the situation mentally subnormal people find themselves in. Policies have moved during the 1970's away from institutional care to support within the community.

The medical model of disease has traditionally been concerned with three dimensions (Figure 1.1). An underlaying causal agent leading to a change in bodily system which results in the symptoms associated with disease. Medicine aims to relieve manifestations of disease through an intervention based on a scientific understanding of the relationship between these dimensions.

As the prevalence of chronic disease has increased, the model has become more frequently characterised by insidious onset, longer duration with a long-term and uncertain loss of function as an outcome. Professionals have therefore been more commonly faced with helping individuals cope with these long-term consequencies of disease and the medical model has been extended accordingly (Figure 1.2).

As a result of the increased involvement of health professionals in longer term chronic illness the terms "impairment", "disability" and "handicap" have become more frequent in use as an aid to inter-disciplinary communication (Thomas,1982). Several attempts have been made to rigorously define these terms, describe their relationship to each other and to provide a classification system for their manifestations. The majority of these attempts have incorporated both the results of mental and physical impairment. Impairment has been defined as an "anatomical, pathological or psychological disorder" defined symptomatically or diagnostically (Garrad,1974;pp142) and as "any loss of psychological, physiological or anatomical structure or function" (Bury,1979a). Bury has expanded on this to define impairment as :

> "in the context of health care, impairment is a generic term that embraces any disturbance of or interference with the normal structure and functioning of the body, including the systems of mental function."
> (Bury,1979b).

There are a number of definitions relating specifically to mental subnormality which may be subsumed within a general definition of impairment (WHO,1954;Heber, 1959). All tend to focus on a lack of intelligence as an essential criteria (Clarke and Clarke,1975) but also involve the ability to perform educationally or adjust socially. As both of these may vary between cultures and from society to society, the concept of mental subnormality is a social-administrative one rather than having any truly objective reality. There are however generally accepted criteria for the existence of mental subnormality in an individual based on the Intelligence Quotient (IQ). Those with an IQ of below 50 are regarded as severely subnormal and almost certainly in need of

Figure 1.1: The medical model of disease

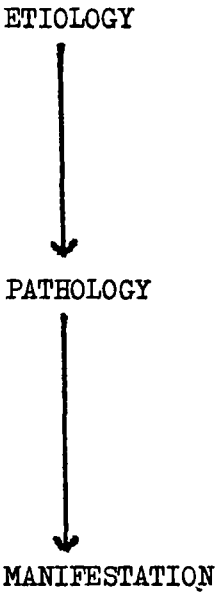
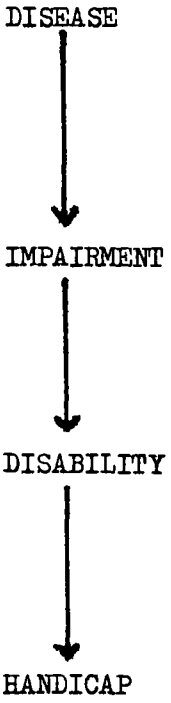


Figure 1.2: The extention of the medical model for the consequences of disease



special help to survive. Those with IQ's below 70 and above 50 are regarded as mildly subnormal and may require special help depending on their cultural norms and on their personal circumstances (Clarke and Clarke,1975).

It is important to note that while phrasiology may differ, impairment can basically be regarded as the most objectively verifiable of the three descriptive terms, describing the exteriorisation of a disease or disorder by the site, nature and severity of loss of functional incapacity. Thomas gives the result of audiometric testing of hearing loss as an example of such an objective description of impairment (Thomas,1982;pp6).

Disability is seen under the model shown in Figure 1.2 as the next stage on the continuum, describing the interference impairment causes in carrying out activities normal to a human being. Bury simply defines disability as :

> "in the context of health care, disablement is the loss or reduction of functional ability and activity that is consequent upon impairment."
> (Bury,1979b;pp32)

As a concept disability is more contraversial because it deals with the restriction of activities and functions normal to a human being. There may obviously be room for disagreement here on what constitutes normal and to what extent this normality holds across a variety of cultural boundries and through time. The more commonly accepted forms of activity restriction associated with the model in Figure 1.2 are illustrated by Thomas. He describes disability as refering to:

> "the impact of impairment upon the performance of activities commonly associated as basic elements of everyday living- walking, negotiating stairs, getting in and out of bed, dressing, feeding, using the lavatory, bathing, holding down a job or just being able to carry on a conversation"
> (Thomas,1982;pp6)

Once again the disability can be the result of physical or mental impairment. The consequence of impairment and disability is regarded as handicap under the model in Figure 1.2, and can be conceived as the socialisation of the original intrinsic disease or disorder. Here the individual is seen not in the abstract carrying out individual daily tasks, but as a whole social being, having a multiplicity of roles within society and the family, and as having expectations made of him as a member of that society. Bury defines handicap therefore as:

> "a disadvantage for a given individual in that it

limits or prevents the fulfilment of a role that is normal (depending on age, sex and social and cultural factors) for that individual".
(Bury,1979a).

Agerholm has suggested that this definition confuses the disadvantages due purely to impairment with the wider and more universally applicable disadvantages found in society. She recognises two forms of handicap, intrinsic and extrinsic, that are related in the following way:

"An impairment is a defect of structure or function...a handicap is a long term disadvantage which adversely affects an individual's capacity to achieve the personal and economic independence which is normal for his peer's...
an extrinsic handicap is one which arises from the individual's environment or
circumstances...an intrinsic handicap is one which arises from
the individual's own characteristics".
(Agerholm,1975)

She uses the Eastern proverb "I wept because I had no shoes until I saw a man who had no feet" to illustrate the difference between extrinsic and intrinsic handicap. Agerholm regards any role loss caused by impairment as a feature independent on the society in which the person lives. Any role losses due to the reaction of society would not fall within any classification or measurement system based on intrinsic consequenses of impairment.

It is more common however to regard a unified concept of handicap, incorporating role loss as a major deter mining factor, as more useful in evaluating the condition of impaired individuals (Taylor,1981). These features are brought together as the basis of the World Health Organisation's attempt at a unified approach to the classification of impairment ,disability and handicap (W.H.O.,1981;pp27-28). The definitions they produced were :

"In the context of health experience...an impairment is any loss or abnormality of psychological, physiological, anotomical structure or function...
disability is any restriction or lack (resulting from impairment) of ability to perform an activity in the manner or within the range considered normal for a human being...a handicap is a disadvantage for a given individual , resulting from an impairment or disability, that limits or prevents the fulfilment of a role that is normal (depending on age, sex, and social and cultural factors) for that individual"

Handicap is the most subjective and therefore the most controversial stage in the continuum. To be handicapped is a complex situation involving value judgements being made by others about the characteristics of the individual such as his social worth or expectations of his dependency. Handicap will be dependent not only on impairment but on the resources available to the individual, society's attitudes this impairments and also his own psychological make-up (Thomas,1982).

1.3 The Classification of Impairment, Disability and Handicap

In addition to the shift from acute infectious to chronic debilitating conditions during the nineteenth and twentieth centuries, there have also been major shifts in public attitudes towards people with handicaps (Blaxter,1976; Finkelstein,1980). This has been made apparent by the increase in service provision for the handicapped and the increased proportion of legislation direct towards them. In general the increase in the amount of social policy directed towards the handicapped has produced a need for information on the needs of handicapped people in Britain. Information for social and rehabilitation policy was restricted because the agencies best placed to collect information on the handicapped were using different definition and descriptive terms and also different classification tools. The World Health Organisation addressed itself to this problem and throughout the 1970's international discussions took place in search of a classification system for the outcome of disease and for a systematic set of definitions and descriptive terms (W.H.O,1973). The W.H.O was also concerned that any such system should be compatible with the existing numerical International Classification of Diseases (ICD). Eventually a system was commissioned from Wood and in conjunction with Bury and others at the Arthritis and Rheumatism Council Epidemiological Research Unit at Manchester University, he produced the International Classification of Impairments and Handicaps for inclusion in the 9th ICD revision conference. The Wood classification system is based on the linear continuum shown in Figure 1.2 and is a classification of the three component concept (Figure 1.3).

The first part of the classification breaks down impairment into the functional areas of the individual. Disease or genetic inheritance may effect an individual's ability to carry out normal intellectual functions such as reasoning or planning. Language may be affected by a stroke or directly by disorders of the parts of the body that produce speech, the larynx or tongue for example. The common feature is that a particular impairment of

Figure 1.3: World Health Organisation International Classification of Impairments, Disability and Handicap- main headings

Impairments	Disabilities	Handicaps
Intellectual	Behaviour	Orientation
Other Psychological	Communication	Physical Independence
Language	Personal Care	Mobility
Aural	Locomotor	Occupation
Ocular	Body Disposition	Social Integration
Visceral	Dexterity	Economic Self-Sufficiency
Skeletal	Situation	Other
Disfiguring	Particular Skill	
Generalised, Sensory & Other	Other Activity Restriction	

Source : W.H.O. (1981)

function can occur as a result of many unrelate diseases or disorders. The effects of impairments are then followed through in the classification to their corresponding effect on the activities of daily living; disabilities. An intellectual impairment could lead to a disruption of communication for the individual concerned, or effect the ability to act in a socially acceptable way. Equally it could lead to a reduction in the ability to carry out personal care tasks. Finally the classification recognises that any of the disabilities could effect the roles people play in every day life and therefore result in handicap. For example a locomotor disability could effect a persons social integration and their economic self-sufficiency. Equally someone with a disfigurement (an impairment), may suffer no observable disability but be as handicapped in terms of social integration and economic self-sufficiency as someone with a locomotor disability due to the reaction of people to their unsightly appearance. The other significant attempt at synthesis to come from the WHO discussion process was the "Agerholm Classification of Intrinsic Handicaps". Her classification is fundementally different, stemming from her less orthadox definitions of "in trinsic" handicap described previously. Figure 1.4 shows Agerholm's Classification of Intrinsic Handicaps, with 41 handicap components (also referred to by her as impairments)(Agerholm,1979).

The 41 impairments cover the same ground as the elements of Wood's classification of Impairments. Agerholm's key intrinsic handicaps are analogous to the impairment classication of Wood. Agerholm maintains the state of handicap remain at the functional level of the bodily system. Disadvantage arises as a seperate state due to difficulty experienced with a defined set of common daily tasks (Figure 1.5).

The individual items of difficulty and more importantly their groupings are now analogous to Wood's classification headings for disabilities, although the difficulties play no real part in Wood's classification model. Agerholm regards the loss of role so crucial to the Wood classification of handicap as features of "extrinsic" handicap and therefore not a valid basis for the classification of disease related events. This becomes more understandable if one examines Agerholm's concept of what constitutes a human being, the intellectual root of her classification system. Agerholm has attempted to specify those activities a human being must be able to carry out to remain personally independent, regardless of age, culture or climate. These are :

to see to move around and manipulate his environment

to service himself (ingestion, excretion, rest etc)

Figure 1.4: The Agerholm Classification of Intrinsic Handicaps

Key Handicaps	Handicap Components
1. Locomotor Handicap	A. Impaired mobility in environment B. Impaired postural mobility(relation of parts of body to one another) C. Impaired manual dexterity D. Reduced exercise tolerance
2. Visual Handicap	A. Total loss of sight B. Impaired (uncorrectable) visual acuity C. Impaired visual field D. Perceptual defect
3. Communication Handicap	A. Impaired hearing B. Impaired talking C. Impaired reading D. Impaired writing
4. Visceral Handicap	A. Disorders of ingestion B. Disorders of excretion C. Artificial openings D. Dependence on life-saving machines
5. Intellectual Handicap	A. Mental retardation (congenital) B. Mental retardation (acquired) C. Loss of learned skills D. Impaired learning ability E. Impaired memory F. Impaired orientation in space or time G. Impaired consciousness
6. Emotional Handicap	A. Psychoses B. Neuroses C. Behavioural disorders D. Drug disorders (including alcoholism) E. Antisocial disorders F. Emotional immaturity
7. Invisible Handicap	A. Metabolic disorders requiring permanent therapy(e.g. diabetes,cystic fibrosis) B. Epilepsy, and other unpredictable losses of consciousness C. Special susceptibility to trauma (e.g. haemorrhagic disorders, bone fragility) D. Intermittent prostrating disorders(e.g. migraine,asthma,vertigo) E. Causalgia and other severe pain disorders
8. Aversive Handicap	A. Unsightly distortion or defect of part of body B. Unsightly skin disorders and scars C. Abnormal movements of body (athetosis, tics, grimacing, etc.) D. Abnormalities causing socially unacceptable smell, sight or sound
9. Senescence Handicap	A. Reduced plasticity of senescence B. Slowing of physical or mental function of senescence C. Reduced recuperative powers of senescence

Source: Agerholm M (1975)

Figure 1.5 : Agerholm Handicap Profile - Basic List

Difficulties experienced:

Getting out and about
Moving around at home
Communication
Home care
Family care
Self care
Special self care need
Self organisation
Employment
Education
Other activities

Source : See Appendix 2 for full Handicap Profile

to have normal resistance to the stresses and traumas to which human beings are subject, and normal recuperative and restorative potential
to groom himself (this includes the management of clothing)
to communicate with his fellows (reception and expression and specific language ability)
to organise himself intellectually (includes conceptual thought ,reasoning, memory, planning)
to organize himself emotionally (includes self control, motivation, etc.)

(Agerholm,1979;pp29)

The list of features focus in on the individual at the functional level, and pays no attention to the role of the individual as social animal. To highlight the distinction she gives the example of a rabbit in a hutch who can neither see nor run. If this is due to misfunction of the rabbit there is intrinsic handicap, if due to their being no light in the hutch and no room to run, the handicap is extrinsic (Agerholm,1979). The fact that Wood and Agerholm reach different conclusions is influenced to an extent by the brief they started with. Agerholm has been mainly concerned with communications between professionals concerned with the rehabilitation of individuals (Agerholm,1975;pp 2). The WHO aims when they commissioned Wood to develop a classification were to provide the basis for a statistical tabulation and retrieval of individual cases for both health and social services agencies (WHO,1973). Wood has had to bridge the divide between individual level disfunction and individual within society. While controversial, the Wood classification is more liable to open up the whole problem of discrimination and disadvantage of the handicapped than is the Agerholm classification because of the central place role plays within it.

1.4 Measurement of Impairment, Disability and Handicap

As social policy for the handicapped has expanded through the years, so social researchers have become more concerned with determining the need for compensatory services. With increasing provision almost inevitably came a concern among administrators with the assessment of eligibility for receipt of services, forward planning and related research. Both concerns have involved the measurement of the degree of handicap among individuals and their need for help (See for example the introduction to DHSS, 1976 for the primary concerns of the DHSS in this field). A number of studies have undertaken the measurement of impairment and disabilities and these have looked in the main at disorders experienced and the effect of this on the ability of those interviewed to

carry out a range of daily personal or home care tasks. One of the most influential was Townsend's "Index of Incapacity" (Figure 1.6)(Townsend,1962).

Individual elderly people were scored by the number of tasks they could perform without aid to produce the index. More sophisticated techniques were also applied to create indeces of this sort from questions on functional ability, including Guttman Scaling (Rosow and Beulieu,1966). A more comprehensive scale was developed by Sainsbury (1968)and directly applied to disabled people (Figure 1.7).

Here functional items are divided into three sections; personal tasks, household tasks and physical and mental faculties. Again each item is given equal emphasis to provide an index of incapacity, although Sainsbury notes that some weighting is desirable as certain features are more important to personal independence. 1970 proved to be a water-shed in many ways. Following the publication of the Seebohm Report on Local Authority Personal and Allied Social Services in 1968 (Seebohm,1968), a survey was carried out by the Office of Population Censuses and Surveys (OPCS) on the handicapped and impaired in Great Britain. This provided valuable information on the number and needs of the impaired and handicapped and put into perspective the task facing the newly established social services departments.

The Amelia Harris survey, as it has come to be known, originally aimed to use a detailed set of activity tests developed by Bedford College as the basis for its assessment of degree of impairment and handicap (Harris,1971). Eventually these tests were not used as interviewers objected to the fact that subjects were to be asked to carry out repeated functional tasks, such as stepping up and down stairs, which might lead to accident or collapse. Grouping by incapacity was therefore carried out on the basis of reported inability to carry out activities involving detailed personal care functions (such as bathing, toileting, feeding) and others (such as getting in and out of bed, clothing ones self and personal grooming) (Harris,1971;pp254-262). The Harris Survey used a multi-dimensional scaling procedure with three scores for level of difficulty in carrying out each of the functional items, and a further weighting factor for whether the items were major or minor. The scores obtained were then grouped to form categories representing severe and appreciable handicap (Buckle,1971;pp137,145)(See Figure 1.8).

1970 also saw the Chronically Sick and Disabled Persons Act pass onto the statute books. Much of this private members bill was inspired by the information revealed by the Harris Survey, and the first section of the act made

Figure 1.6: Townsend' Index of Incapacity*

I. Mobility and Personal Care

1. Get in/out of bed
2a. Bedfast- wash hands and face
2b. Not bedfast
3. Stairs
4. Wash
5. Dress
6. Bath

II. House Care

7. Prepare meals
8. Clean floors
9. Coordinate mental faculties in other tasks

III. Communication

10. See
11. Hear
12. Speak
13. Organise thoughts for social communication

IV. Dealing with Special Handicaps

14. Fits etc.
15. Urine, faeces
16. Other

* Each identified as :

0 without difficulty or with slight difficulty

1 moderate difficulty or only in part

2 not at all or minimally

Source : Townsend (1962)

Figure 1.7: Sainsbury's Index of Incapacity

Personal tasks

Go in and out of doors on own
Go up and down stairs
Get about home on own
Wash down/bath
Dress and put on shoes
Cut own toenails
Get in/out of bed
Brush/comb hair
Going to toilet on own

Household tasks

Clean floors
Make a cup of tea
Cook a hot meal
Do the shopping

Physical and mental faculties

See
Hear
Speak
Organise thoughts in lucid speech
Sit/move without falling or giddiness
Control urine
Control faeces
Managing their disabilities without help
Coordinate mental faculties in performing personal services

Source: Sainsbury S (1968)

Figure 1.8: Index of Degree of Self-Care Handicap

Very Severe(Special Care)

1. Toilet help every night+ feeding and dressing, or washing and toilet
2. Regular nightly toilet help+ help feeding/washing/dressing, or much daytime feeding/washing/ toilet help
3. Bed or chair-fast, or mentally unable to care for selves- but less help than 1. or 2.

Severe

4. All difficult, or most difficult + some impossible
5. Most difficult, or 3-4 difficult + some impossible

Appreciable

6. Difficulty some items or help with minor items

Minor/none

7. Difficulty one or two items

8a.(Non-motor):

No 'physical' impairment problems but main impairment sensory etc.

8b.(Motor):

No self-care difficulty

Major Items - Using WC
Doing up buttons and zips
Feeding

Minor Items - Getting in/out bed
Bath or all-over wash
Washing hands and face
Putting on shoes & socks
Dressing
Doing hair (Women)
Shaving (Men)

Source: Harris (1971)

Figure 1.9 : OECD Long-Term Disability Items

1. Ability to read newsprint
2. Ability to see a face at 4 metres
3. Ability to have a conversation with at least two other persons
4. Ability to hear a conversation with one other people
5. Ability to speak without difficulty
6. Ability to carry an object of 5 kilos for 10 metres
7. Ability to run 100 metres
8. Ability to walk 400 metres without resting
9. Ability to walk up and down one flight of stairs without resting
10. Ability to move between rooms
11. Ability to get in and out of bed
12. Ability to dress and undress
13. Ability to cut one's toenails
14. Ability to pick up a shoe from the floor when standing
15. Ability to cut up food
16. Ability to bite and chew hard foods (with dentures if applicable)

Classified as:
1. Yes, without difficulty
2. Yes, with minor difficulty
3. Yes, with help of another person
4. No, not able to

Source : O.E.C.D. (1982)

it a duty of each new local authority social services department to inform themselves of the numbers and needs of the disabled in their area (CSDP Act 1970;Section 1(1)). Subsequent central government circulars advised local authorities that sample surveys of the Harris Survey type were sufficient (DHSS,1971) and that in future registration figures for disabled people should be presented to central government in the severity categories used by the survey (DHSS,1972). Many surveys were carried out under the auspices of the act during the 1970's, many using the Harris items of functional ability as a basis for determining need (Brown and Bowl,1976;Knight and Warren,1978). Indeed many social services departments still use these items as a basis for internal client referral categorisations and in assessment for service requirement.

In 1968-69 Townsend carried out a major national sample survey within 51 electoral constituencies in the United Kingdom involving interviews with 3260 households. The surveys main focus was poverty, but as part of the survey a series of questions were asked relating to impairment and functional incapacity. A twelve heading list was used to establish what impairments were suffered by those interviewed, to an extent that it:

> "prevents him/her from doing things which an ordinary person of the same age might expect to do"
>
> Townsend(1983,pp 1141).

The survey then went on to ask the extent to which those problems lead to difficulty with activities of daily living. A maximum "Incapacity Score" of 18 points could be generated if the person could carry out none of the tasks. Four sub-categories were defined by Townsend for level of incapacity; Slight, Some, Appreciable, and Severe/Very Severe.

The Organisation for Economic Co-operation and Development (OECD) took a different approach to the measurement of disability. As part of a wider initiative to design international ly comparable social indicators of social well-being they disgarded the WHO definitions of Impairment, Disability and Handicap as too restrictive. The disruption of normal activity was seen as the key factor for study and they adopted "the consequence of the effects of ill-health on activities essential to daily living" as the definition of disability (OECD,1982;pp10). Two types of disability were proposed. Time-based disability was a measure of the period a person's normal activity was less effective, and function-based disability measured long-term disability compared to minimum levels of function for the peer group in question. Time based (or short-term) disability was measured as disability days per person per year which

could be further disaggregated according to whether the person is forced to cut down on some of his activities, most of his activities, or spends most or all of the day in bed. This allows a relative scale for comparison as the activities expected to be normal for a healthy young man would be different from an elderly lady. Function-based (or long-term) disability was measured by self reported ability to carry out the functions noted in Figure 1.9, with no weighting given to any of the items. It was recognised in the OECD report that this system represented a new data collection technique for most countries and, though many collected the data necessary to compile the indices, little information would be available in this form until it was generally accepted and implemented.

Only one field survey involving the Wood classification explicitly has been carried out (Patrick et al,1981). This study used 25 items to screen the Lambeth population in London for those with disabilities. Figure 1.10 shows the items used, and again the measurement of disability is based on the inability of individuals to carry out a basic set of daily activities, supplemented by in this case a number of social role indicators.

The Agerholm "Handicap Profile" shown in Figure 1.5 has been used frequently in surveys as a measurement tool (Outset,1979,1980,1982a-c). Although commonly used within the Agerholm conceptual framework, in its extended form it has 124 items covering all the main items of functional ability has been used throughout the 1970's to determine "disability". The full "Handicap Profile" is shown in Figure 1.11.

It is clear that the dominant way of measuring "disability" in the 1960's and the 1970's has been in relation to the difficulty experienced in carrying out essential tasks associated with daily living. Assessments have focused on the relative dependence of the individuals concerned within their environment , the level of dependence being seen as the outcome primarily of the physical and mental impairments of that individual. It has been pointed out, however, that classification and measurement systems which concentrate on the disabled person in isolation ignore the potentially restricting interaction of impairment with the social and physical environment (Sainsbury,1968; Walker,1983). The physical and social environments may, if modified, help to reduce or illiminate any effective disability or, more commonly, they may define the disability or substantially compound the problems associated with it.

Figure 1.10: Lambeth Study Measurement Scale of Disability

Ambulation and Mobility

Walking
Negotiating stairs
Going outside the house
Crossing the road
Travelling on bus or train

Body care and movement

Getting in/out of bed/chair
Undressing
Kneeling or bending
Bathing
Holding or gripping
Controlling bowels or bladder
Toiletting

Sensory-Motor

Giddiness or fits
Frequent falls
Weakness or paralysis of extremity
Visual difficulties
Hearing difficulties
Loss of extremity

Social Activity

Limitation because of illness in working at all
Doing job of choice
Doing housework
Visiting family or friends
Engaging in any other social activity

Source: Patrick et al (1981)

Figure 1.11: The Agerholm 'Handicap Profile'

Difficulties experienced:

A. Getting out & about
1. Getting in and out of house
2. As pedestrian
3. In shops etc.
4. On public transport
5. As self driver
6. As car passenger
7. As cyclist
8. As wheelchair user
9. Because of severe fatigue
10. With parking
11. With toilet
12. Finding way around
13. Using guide dog
14. Emotional problems
15. Behavioural problems
16. Special risks
17. Other(state)

B. Moving around at home
1. Stairs
2. Steps
3. On level
4. Doors and passages
5. Seeing things in way
6. Finding way around
7. Falling
8. Sit:stand, stand:sit
9. On off bed
10. In:out garden
11. Using switches, windows etc.
12. Reaching, picking things up
13. Other(state)

C. Communication
1. Hearing
2. Talking
3. Writing
4. Reading
5. Answering door
6. Talking with strangers
7. Talking with family
8. Using telephone
9. Contacting GP and other services
10. Getting help in an emergency
11. Other(state)

D. Home care
1. Light cleaning
2. Thorough cleaning
3. Light kitchen work
4. Major kitchen work
5. Bed making
6. Washing (laundry)
7. Minor repairs
8. Decorating and maintenance
9. Cleaning windows
10. Garden care
11. Shopping
12. Other(State)

E. Family care(other than of unhandicapped spouse)
1. Child care at home
2. Nursing of sick child or relative
3. Escorting family
4. Supervising family activities
5. Communicating with and for family
6. Other(state)

F. Self care
1. Getting up(dressing & toilet)
2. Going to bed(undressing & toilet)
3. Using toilet
4. Washing all over/using bath
5. Foot care
6. Feeding and drinking
7. Preparing own food
8. Altering position in chair, bed
9. Weak(leaking etc.) bladder
10. Weak(leaking etc.) bowel
11. Other(state)

G. Special self-care need
1. Taking prescribed medicine(s) injection(s) etc.
2. Managing appliances(calipers
3. Managing discharging sinuses colostomy & surgical openings
4. Managing incontinence
5. Managing epilepsy
6. Need for special precautions
7. Dependence on machines
8. Other(state)

H. Self organisation
1. Mental retardation or other intellectual deficit
2. Emotional disorder
3. Behaviour problem
4. Memory disturbance
5. Space or time confusions
6. Danger to self or others
7. Reduced consciousness
8. Reduced responsibility e.g leaves gas on, wanders off
9. Other(state)

I. Employment(due to handicap)
1. Finding suitable work
2. Transport to and from work
3. Premises at work
4. Communication problems at work
5. Fatigue
6. Unwelcome
7. Need time off(sickness)etc
8. Other(state)

J. Education(due to handicap)
1. Transport
2. Premises
3. Special education needs
4. Special help needs
5. Unwelcome to staff
6. Unwelcome to fellow students
7. Other(state)

K. Other activities(state)

Source: Agerholm M, Blake N, Cooke K(1976)

1.5 The Social Reproduction of Handicap

Baldwin (1977) has pointed out that many researchers trying to investigate the problems of "being disabled" have concentrated on measuring what is wrong with the individual and how this proves to be a problem in living a normal life. This concentration on the individual and his disablility has led to an emphasis on what is different about disabled people in comparison to other people in society, and how this causes them to be dependent on their families and on statutory services. More recently there has been a call for more attention to be paid to the role society itself plays in the creation of a group known as "the disabled", or "the handicapped" from a number of individuals with an enormously wide range of disorders, and impairments. Finkelstein (1980,pp 47) has said that disability and handicap are not the :

> "...attribute of an individual but the outcome of an oppressive relationship between people with physical impairments and the rest of society."

This oppressive relationship has been identified as acting through actual discrimination that has an effect on all aspects of the quality of life of mentally and physically impaired people. This discrimination can be identified as operating at three interdependent levels, the cognitive (or the level of the individual social relations); the social (or the level of groups, classes and organisations); and the economic (or the structural organisation of production and productive forces)(Oliver,1979).

Discrimination works against the integration of people with a disability into society, and reduces their independence. At the cognitive level processes of stigmatisation of those with a disability by those without, may lead to the former being isolated from the normal ebb and flow of social interaction. At the social level people with a disability may be barred from the activities that the majority of us hold to be normal, such as employment, leisure, or education by physical or administrative barriers.

At the social level legislation that is designed to redress the imbalances created for the people with a disability can be seen as to a large extent ineffective at tackling many of the root sources of descrimination of this sort. This is because the legislation, and the service systems that stem from them, do not define the problem to be tackled as one involving the very ideologies at the heart of our society. The problem may be seen as how to reverse the devaluation of people with disabilities that takes place when our individual, and corporate value systems come into play (Finkelstein,1980).

There are currently a number of expectations of what level of normality in life style "devalued" people (including people with a disability) should achieve, and therefore, what service systems should aim to promote. These have been made explicit by authors such as Wolfensburger (1972) and Nirje (1976) among others, who may collectively be termed the normalisation movement. Tyne (1981) has expressed the normalisation principle as :

> "The use of means which are valued in our society in order to develop and support personal behaviours experiences and characteristics which are likewise valued."
>
> Tyne (1981;pp 1)

As a means by which services are designed to help people, normalisation stresses therefore, the need to use methods, practices, and images that we might all view as valuable and worthwhile. It is argued that if people with difficulties are presented as different, isolated, placed in segregated institutions and generally treated in dehumanised ways, then they will live up to those expectations. The emphasis within the movement is on providing residential environments that we would all recognise as normal, with regimes that would allow for privacy, respect, individualisation and choice for those living their. The services are seen as setting out to promote a positive image for disabled people in the eyes of the rest of society. This approach entails not grouping together people with similarily devaluing problems, providing good clothing, and also activities that inhance the status of the person in society.

It is however recognised as fundamental by those in the movement that people with special difficulties will require special help to overcome those difficulties. Within their philosophy these attempts at providing special help should be brought about through the use of means that we would all commonly value. It is through the explicite use of good cultural analogues that disabled people will have their value reinforced within all our eyes at the same time as achieving increased independence. In our society, legislation and the complex services that result from them, plays a fundemental role in providing that "special help".

The body of United kingdom legislation covers a large range of areas that influence the lives of people with a disability. These include special accommodation personal care, mobility, welfare benefits, leisure, physical access to establishments, employment, and importantly their personal growth through education. It has been argued however, that the legislation is not designed to

direct help appropriate to peoples assessed needs, and promoting valued images and lifestyles for disabled people. The existing body of legislation instead represents a piecemeal incremental growth of elements of service based on the perceived economic benefit of providing these services, at each time in history when they are drafted. The concepts of economic benefit owe much more to the dominant economic structures in which we all live, than to the goals of revaluing the lives of people with disabilities (Topliss, 1983).

In analysing the real aims and objectives of present day legislation and services for disabled people, Topliss (1983) has suggested that rationality is an important factor. Rationality is a fundamental value in highly developed industrial societies, and that it is a value shared by both citizens and governments in those societies. In lieu of any other universally understood measures of outcome for social policy, Topliss suggests that economic value has been adopted as the common criteria for rationality. Economic rationality has therefore, come to be the means by whch the justification for imposing sacrifices on the general population for the good of disabled minorities is to be judged. Economic rationality as a mechanism will, by definition, favour elements of social policy that can be clearly seen to have benefical outcomes for society as a whole, as well as the disabled themselves. With many of the policies required to move radically towards full integration of the disabled having less tangible outputs in terms of the benefit of the rest of society, a normal life remains a dream for many people with disabilities. Topliss suggests that the result of developments of services on this principle is where levels of provision at local authority level are determined not by levels of individual need, but by economic and administrative considerations based on economic rationality. It must be recognised that concepts of what is rational in economic terms, themselves derive from wider structural considerations deriving from the framework of capitalism within which we live.

Discrimination at the level of the structural organisation of production

> "These three levels, the cognitive, the social and the economic (structural) are neither completely interdependent of each other nor is one determined by the others. Rather they are interdependent and changes in one level may act as a catalyst for changes at the others. However, it is quite clear that it is the economic level, that is the forces of production, which has the most persuasive effect upon the other two levels. To put the matter simply, the economic base of society, i.e. hunting and gathering, agriculture, or industry, effects the

kinds of groups and organisations that are formed and indeed the way people think about the world in which they live."

Oliver (1979;pp 3)

This level of discrimination involves a structural analysis of society which sees capitalism in control and the primary driving force being the profit motive. In such a state there are two sorts of individual, those who have control over the means of production and those who do not. Among those who do not there remains only the sale of their labour to maintain themselves. Within a capitalist society there is a need for workers with different levels of skill. Wages paid to workers have as a component the cost of replacing workers- the cost of education and teaching skills to children. With different skill requirements come different levels of wage, and a hierachy of workers then develops, which may ultimately emerge as class differences. These classes then themselves compete , the class who start with a better educational and wages, tend to widen the resources gap between it and people of a lower social class (Peet,1975).

The capitalist system can bring with it a dominant set of values which those within it tend to share as part of their membership. The work ethic, where work itself is seen as fundamentally good and an individual necessity, promotes competition and materialism within the economic system. Those who cannot work competitively by virtue of their lack of education or skills may then be found in lower paid jobs which lack status within society, or without a job which can lead to reduced status through not fulfilling the expectations of a widely held work ethic. For disabled people no work or work in low status or low paid jobs is very common. They then face the dual problems of lack of social status in a society which takes many of its values from the work that one does, and the material deprivation of living with low earned incomes, or welfare benefit support. The elderly disabled are spared this because they are in many cases retired. The elderly themselves suffer from reduced status in society irrespective of whether they are disabled, and their withdrawal from the work place is a major influence on their position in society.

It is clear that in the British welfare state it is still possible for an unemployed disabled person to be maintained at some level by the state. However, a second form of discrimination can be identified at this point again stemming, it has been argued, from the imperatives inherent in the principal motivations of capitalism. The process of accumulation of profit is unstable and this leads to rounds of restructuring in an attempt to maximise profit from production. This can result in

particular areas suffering the withdrawal of jobs, and therefore facing higher levels of unemployment, urban decay, and some of the other undesirable social problems associated with areas in decline. To maintain a stable environment for the continued accumulation of profits it is necessary to maintain the unemployed, and those unemployable within the system as it stands , through welfare benefits. Only levels of maintenance consistent with keeping stability for profit ble trading is necessary, and state support does not maintain the economically unproductive such as the disabled, at anything near the average wage. Neither is it necessary under such a model to provide services of a type or of a level which actively promotes valued images for people with disabilities, and which reduce substantially their handicap.

1.6 The Relevance of Medical/Social Geography to Handicap

Giggs (1979,pp 85) has provided a useful summary of the various trends in the geographical study of ill-health, and has suggested that the relevant research has been characterised by the following approaches:

1. The spatial patterning of ill-health and mortality.

2. The spatial patterning of the physical and human environmental characteristics that adversely affect man's state of health.

3. The spatial patterning and use of the main elements of the health care delivery systems developed to combat diseases and the environmental hazards that affect man's health.

The definition of "handicap" given in this Chapter characterises handicap as consisting of a number of dimensions. The multi-level definition of the geography of ill-health provided by Gigg's would suggest that these approaches can help us to understand patterns of disability and handicap. A closer examination of the various approaches taken at each of these levels can provide an idea of how they may contribute to an explanation of patterns of handicap.

Phillips (1981) has reviewed recent trends in health related geographical research. He has noted that a broad split may be identified consisting of a more traditional approach, which he has termed "ecological medical geography", and a contemporary approach he has termed "the geography of health care". The two approaches have been related to two different paradigms in geography, the first relating to environmental determinism in which specific factors in the physical environment were seen to

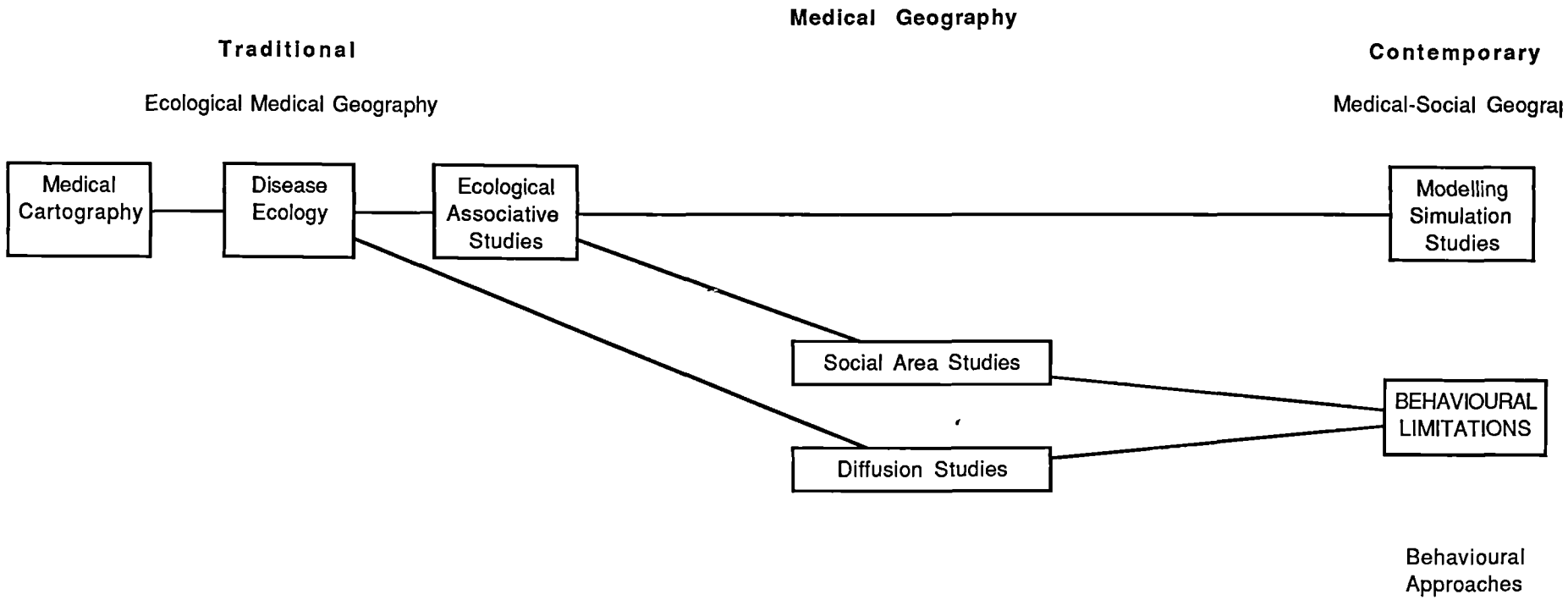
directly influence the incidence of disease. The second paradigm identified by Phillips is that of spatial analysis, and associated concerns with the need for social relevance in geography. These were themselves reflections of the "quantitative revolution" which took place in the early 1960's. The main concerns of those geographers operating within the contemporary approach have been with the nature and organisation of health delivery systems and with the behaviour of those who consume these services. One principle issue has been whether the distribution of these services and access to them are compatible with the concepts of Territorial Social Justice (Phillips,1981 ; p 4).

Phillips has developed a framework for discussing research approaches under the heading of medical-social geography, and this is shown in Figure 1.12.Here the "traditional" and "contemporary" approaches are further sub-divided into coherent traditions. The approaches termed medical cartography, disease ecology, and ecological associative traditions share a concern with the discovery of associations between diseases and particular types of environment. They differ in the extent to which statistical techniques are used to identify any associations which exist.

In the first of these traditional approaches the emphasis has been on the mapping of disease patterns, often with the intention of identifying causative environmental factors. At an earlier stage in the process, the identification of higher than average rates of occurrence of diseases has also formed a goal of disease mapping, as in the case of regional or national disease atlases. While many of the classic examples of such an approach come from earlier times, the approach continues to play a role in medical geography (Pyle,1976).

Any studies carried out in the disease ecology approach have been carried out, these having as their focus the elements of the natural environment that contributed to the spread of disease among humans, and characterised in the work of May in the 1950's. The approach subsequently saw the introduction of more sophisticated types of spatial analysis to that of May during the 1960's. Phillips has suggested that these fall into two sub-groups depending on the degree of statistical sophistication adopted. At the most simple level those studies in the ecological associative tradition looked at the environmental correlates of disease. The second level, termed "Social Area Studies", looked more broadly at the socio-economic characteristics of areas with high levels of disease. In these cases a number of "undesirable" features were commonly found to be associated with indices of ill-health. Social area studies have formed a bridge between traditional and contemporary approaches, as a number of studies of this

Figure 1.12 : Spatial approaches to the study of medical subjects Source: Phillips (1981, Figure 3,pp 11)



type have been concerned with the health care system itself, rather than purely the association of social indices with health status. Such studies have dealt with the different levels of access to primary health care facilities enjoyed in areas with different social class structures, and have pointed therefore, to inequalities (Knox,1978,1979).

Placed firmly within the contemporary approach are studies carried out in a behavioural framework. Here the emphasis has been on the individual, and the way in which their view of the world influences their operation within, and their access to the health and welfare system. The information on individual behaviour can be used to explain the disadvantaged position of social or spatially discrete population groups in relation to the health system, and ultimately to their increased risk of ill-health. Of most relevance to the studies of health have been those behavioural approaches which have placed emphasis on the decision making process adopted by consumers. In the health context a combination of the location of health care facilities of different types, and the ability of consumers to overcome distance constraints, have been used to explain aggregate levels of use of these facilities (Girt,1973; Bentham,1979).

Phillips (1981, p 31) has also pointed to important contributions to our thinking that have come from other branches of the social sciences. This may have been in understanding the impact of the dominant social and economic order has on certain social classes, and their subsequent health experience. There is much evidence to suggest that poverty leads in a number of ways to higher probabilities of ill-health and disability. In addition, those involved in the geography of health have learnt much about the role of administrative structures in influencing individual utilisation of health facilities (McKinlay,1972), and the role of class in explaining differential levels of use of health services (Titmuss,1968; Alderson,1970).

Taking Giggs's first category involving the study of patterns of ill-health, it is likely that basic mapping techniques to identify higher than average occurances of particular disabling diseases will be a useful first step in understanding observed paterns of disability and handicap. At the second level relating to adverse physical and human environments, studies in the ecological associative and social area studies traditions may be of use. Firstly they may in themselves provide useful clues to the natural environmental causes of particular disabling disorders. Secondly the methodologies they have adopted may have relevance for current investigations of the causes of patterns of disabling disease.

In the third of Giggs's categories, studies in the contemporary tradition may provide useful methods for looking at the territorial justice of provision of services to the disabled, and furnish explanations on why such differences may exist. As medical-social studies have generally benefited from insights provided by other disciplines, it is likely that political and sociological theories may be needed to achieve a comprehensive understanding of patterns of disability and handicap.

1.7 Conclusion

It is clear from the preceding arguments that concentration on the inabilities of people labelled as disabled can only have limited validity in explaining why people live out a "disabled" or a "handicapped" role. There are complex inter-plays between dominant ideologies in the west, the way in which we as individuals value people, and the emphasis we place on providing help for those that we collectively devalue. The state of being disabled or truly handicapped is not one objectively defined, but is the result of an interaction between intrinsic inabilities in the individual and the level of help or hinderance coming from society itself. This has inportance in approaching the distribution of disability and handicap across space. To explain how any patterning may come about , it is necessary to take into account not only the distribution of impaired people , but also the spatial aspects of policies designed to provide special help to these people. Some aspects of social policy will hold sway across the whole of the United Kingdom, and may not therefore have direct spatial effects at this scale. They may exert secondary influence in two ways however.

Firstly local interpretation of national legislation and associated procedures may lead to spatial differences in the levels of disability and handicap experienced as a result of similar base line impairment. This may occur in the areas of central government concern, in areas such as special employment policies, as in the operation of Disablement Resettlement Officers, or in the administration of discretionary welfare benefit payments. Due to the nature of local government however, there may well be more scope for differences in interpretation in the provision of personal social services to the disabled.

Secondly, the effect of national policies relating to the disabled may constrain the ability of people with a disability to take part in the systems that determine the spatial behaviour of us all. For example, the lack of an effective employment promotion scheme nationally, or inadequacies in income maintenance through welfare benefits, may severely constrain the ability of people with a disability to compete in the housing market, due to their reduced income.

The brief review of approaches in the medical-social geography traditions has shown that both traditional and contemporary approaches may be relevant to a social geography of handicap. The fact that handicap is a multi-dimensional phenomenon underpinned by patterns of disease, impairment, and disability, means that handicap is an ideal vehicle for exploring the relative importance of the various approaches mentioned.

The next chapter goes on to explore the evidence for the existence of spatial patterns in disability and handicap. Firstly it looks to studies of the distribution of the disabled whose state of disability is measured through "traditional" methods discussed earlier in this Chapter. The second approach looks at the evidence relating to spatial variation in support services for the disabled, this forming a set of surrogate measures for patterning of handicap.

CHAPTER 2
DISABILITY AND HANDICAP- NUMBER AND SPATIAL PATTERNS WITHIN THE UNITED KINGDOM

2.1 Prevalence of Disability

As we have seen in Chapter 1, disability and handicap are conceptually different phenomena, disability describing the inability of an individual to carry out the normal activities of daily living, and handicap the associated loss of role in comparison with those regarded as normal for their peers. The purpose of this chapter is to describe the disabled population in the United Kingdom and show how both disability and handicap may vary across space. This is not a straight-forward task as data on disability comes from a variety of sources, in some cases being incompatible with each other, and in other cases open to methodological criticism. An additional complication is the fact that there has been little tradition of making conceptual distinctions between impairment, disability and handicap. "Handicap" has as a result received little attention from researchers, with few studies setting out to measure it directly in the form of role loss. In general therefore, only surrogate measures exist for handicap.

There are two forms of prevalence regarding disability. The first may be called the "real" prevalence which accounts for all those in the study population with a particular disability. This prevalence will normally be derived from comprehensive surveys involving all or some representative sample of the resident population. The second may be termed the "administrative" prevalence and and accounts for all the people known to agencies involved in providing services for disabled people in the study area. This figure will normally be derived from registers or lists of individuals receiving or having received a service from those organisations. Prevalences derived from surveys will in general be more accurate and meaningful than administrative prevalences, the latter being to an extent dependent on the level of service being provided in the catchment, and the accessibility of those services to the disabled population.

One area where the two approaches come together is in the field of mental subnormality. Here the approach to identifying numbers has most commonly been to create special registers of those who are known to receive or to require the help of a number of specialised mental handicap services.(The term mental handicap will be used in this respect as the most commonly used description of this group of people. It would however be more consistent to call them people with mental disabilities given the arguments put forward in Chapter 1). It has been found that for mentally handicapped people aged between 15 and 19 years of age, the "administrative" prevalence approximates to the "real" prevalence, the vast majority of all young mentally handicapped people having been

diagnosed or identified by systematic screening by health or educational services (Kushlick,1969).

There are four major sources of information on the numbers of people with disabilities in the population, their characteristics and their difficulties. These are special surveys specifically designed to examine all facets of disability; surveys of other topics that produce information on the disabled as a bye-product; service planning surveys carried out by local authorities under the CSDP Act; and finally registers kept by local authorities and the department of employment on numbers of disabled people known to the authority and numbers restricted in gaining employment respectively.

2.2 Special Surveys

In the category of special surveys relating to physical disability, the most often quoted is a national sample survey carried out in 1968 by the Office of Population Censuses and Surveys (Harris,1971). The study was designed to produce reliable estimates of the numbers of physically handicapped people aged 16 and over living in private households in Great Britain. The survey also described the health and welfare services being received by those identified in response to their difficulties. The study estimated that over 3 million people were physically impaired in some way, 7.8% of the total population of Great Britain. Of those impaired 157,000 were classed as very severely handicapped, 356,000 as severely handicapped needing considerable support, and 616,000 appreciably handicapped requiring some support, representing a total of just over one million, or a handicapped population of 2.86% of the total population. The survey used a definition of handicap based on the ability of the individual concerned to carry out a number of personal care functions, and not one incorporating a three stage model as suggested by Wood (WHO,1981). Within the Wood classification structure these severity categories would relate to the level of disability of the individual. To avoid confusion Harris's original categories will be re-defined as disability categories for the purposes of this study.

One of the indirect results of the Harris Survey was the introduction of the Chronically Sick and Disabled Person's Act (CSDP) in 1970. The survey stimulated much concern for the situation of those disabled in the country even though the final results were not published until after the legislation was passed. One of the key elements of the Act was the placing of responsibility on local authorities to make themselves aware of the numbers of disabled people in their area and of their needs for services, (CSDP Act,1970:Section 1a). Throughout the 1970's local authority social services departments carried out a number of local surveys to fulfill that responsibility. There are a number of reviews of these surveys and of the methods they employed (Jaenig,1972;

Orwell and Murray,1973; Brown and Bowl,1976) and critics of their effectiveness (Guthrie,1975; Whitehead,1981). Of most relevance here is an attempt to make national estimates of prevalence and of need for personal social services on the basis of these local authority surveys (Knight and Warren,1978). The study found that a number of surveys had attempted to identify disabled children under the age of 16 and derived from these estimates of national prevalence. For children with very severe and severe handicaps the estimated prevalence was 2.4 to 3.0 per 1000 total population in this age group. An estimate of 6.0 to 12.0 per 1000 was made for all handicapped children of this age. It was felt by the researchers that these represented minimum estimates due to systematic under-reporting of handicap among children by families.

In general the researchers found an age distribution very similar to that reported by Harris, with prevalance rates rising to a peak among the elderly. Their overall estimate of handicap prevalence was 2.8 per 1000, which was consistent with the Harris findings when one takes into account the suggestions that the Harris survey led to some systematic under-reporting of prevalence.

There have been a number of critisms of the Harris Survey, mainly concerning under estimation of prevalence by the survey method adopted (Taylor,1977; Hennessy,1979; Townsend,1979,pp609-705). Criticism centres on two issues. Firstly an initial postal questionnaire did not specifically ask for information on all residents, only for an identification of those with characteristics of interest. It was felt that this may have lead to an under identification for the subsequent detailed follow-up stages. Secondly those replying that no one in their household was disabled were not sub-sampled to determine the validity of their responses and if prevalences were therefore under-estimated. The Knight and Warren study included 27 surveys that either used the survey method used in the Harris Survey, or a modified form of it. As a result the conclusion of the Knight and Warren report are open to the same criticism as Harris herself. The methodology may well under-estimate prevalence, even considering that the study includes estimates of the number aged under 16 where Harris did not. Townsend (1984) has drawn attention to the discrepancy between the prevalence estimate made by Harris and estimates derived from other official sources and from his own national survey of poverty. Table 2.1 shows a range of international prevalence figures and those derived from the General Household Survey and the Townsend poverty survey.

The Townsend estimate and the 1972 and 1981 GHS surveys were based on definitions of disablement stressing the effect of long-standing illness on the ability of those involved to take part in everyday activities. Townsend was therefore able to derive a figure of 3 million people who had some, an appreciable or a severe incapacity in the

Table 2.1 : The percentage of the population of working age who are disabled (five countries 1960-1981)

National Surveys-(Age)			Percentage of Specified pop'n
United States	1966 (18-64)	US Dept.of HEW, disabled,	17.2
		including severely disabled	5.9
	1978	US Dept.of HEW, disabled,	16.8
		including severely disabled	8.5
Federal Republic of Germany		Registered Handicapped	8.4
		including severely handicapped	6.7
Denmark	1960-61 (15-61)	Physically handicapped	6.5
Australia	1968 (15-64)	Chronic/limiting condition	8.4
Britain	1968-69 (16-64)	OPCS(Harris) Impaired	3.9
		including handicapped	1.2
Britain	1968-69 (16-64)	Poverty Survey (Townsend)	
		Some, Appreciable or Severe incapacity	8.0
		Disablement condition	11.3
England & Wales	1972 (15-64)	General Household Survey	
		Limiting long-standing illness	11.1
Britain	1981 (16-64)	General Household Survey	
		Limiting long-standing illness	16.1

Source: Townsend (1984), Table 1

Table 2.2 : Estimated numbers of men and women with appreciable, severe,and very severe incapacity from Townsend

	1000's					
Age	Men	%	Women	%	Total	%
10-39	80	7.7	95	4.6	175	5.7
40-49	80	7.7	70	3.4	150	4.8
50-59	200	19.2	220	10.7	420	13.6
60-64	120	11.5	285	13.9	405	13.1
65-69	100	9.6	295	14.4	395	12.8
70-79	275	26.4	655	31.9	930	30.0
80+	185	17.8	435	21.2	620	20.0
All ages	1040	-	2055	-	3095	-

Source : Derived from Townsend(1979), Table A.72

UK. The distribution across age categories are shown in Table 2.2.

As has been pointed out in Chapter 1, Townsend was able to cross check his survey population for disablement resulting in restricted activity, as well as for direct incapacity scores. It is possible from his research to identify a number of people in each incapacity category who report no disablement, and/or no activity restriction due to that incapacity. If these are extracted from the total figure given in Table 2.2, the total is reduced to 1,935,00, a figure that is still well above that found by Harris (Townsend,1979,pp696).

Even allowing for the exlusion of Northern Ireland in the Harris figures there remain remarkable differences, especially when one considers the Harris and Townsend Surveys took place around the same time. Townsend has drawn attention to the prominence the Harris figures have been given in deriving policies for the disabled (Townsend,1984,pp124; Dept. of Employment,1973; MSC,1978,1979), and has suggested that the General Household Survey (GHS) estimates would make a better basis for planning.

The Amelia Harris Survey did include those people who were impaired or handicapped as a result of mental subnormality, but specific estimates of prevalence were not made. As we have seen in Chapter 1 , Heber has defined mental retardation as one associated with an impairment of maturation, learning or social adjustment originating in a period from birth to sixteen years of age (Heber,1959). The definition is obviously wider than Harris's which gave emphasis on locomotor functions and self-care abilities, and therefore one has to look further for accurate estimates of prevalence of mental handicap.

There are a number of complexities involved in the estimation of prevalences of mental handicap. While a number of definitions exist and have been discussed earlier, they all focus on the lack of intelligence as an essential criteria. Many definitions involve difficulty in educational and social functioning of individuals that result from this lack of intelligence, and which themselves are culturally dependent and open to differences of interpretation. There will obviously be areas of subnormality where boundries will be fuzzy and where individuals will be open to mis-classification. As mental subnormality has most commonly been measured in terms of IQ, the area of marginality is mainly for those with IQ's over 55 and approaching 70. This is the region where the nature of attitudes, employment structures, education, family and community support can have a marked effect on whether someone is classified as mentally subnormal or not. At IQ's below 55 the probability that special help will be needed is great. This becomes an absolute certainty at IQ's below 50, irrespective of

cultural context (Clarke and Clarke,1973,1975).

The potential need for services is important. Tizard has identified two measures of prevalence, administrative and true, and both are dependent to a great extent on the contact of individuals with existing agencies for identification. The administrative prevalence is a measure of the number of individuals in an area that would require services dedicated to the mentally handicapped, should those services exist. This measure is then to a certain extent dependent on the level and accessibility of services already in existance in the area, as these form the channels through which individuals are identified in a survey. True prevalence measures all those with any degree of subnormality irrespective of whether they would need services and forms a wider population including those at the fringes of the subnormal. There are two sorts of information source on prevalences; one off surveys of either true or administrative prevalence, registers of the mentally handicapped that almost exclusively provide administative prevalences being based on those known to existing service providers.

A study of six representative areas in England and Wales carried out by Lewis in the late 1920's found an "extra-metropolitan" rate of 3.88 per 1000 aged 7-14 years of age (Clarke and Clarke,1975,pp8). Tizard (1964) carried out a study in Middlesex and found a rate of 3.45 per 1000 aged 7-14. Given the increase in life expectancy over the period involved among many of those born with disorders leading to mental subnormality (especially among children with Downes Syndrome) this represented a significant fall in the incidence of some mentally handicapping disorders.

Kushlick (1969) has argued that the age range 15-19 is one where administrative and true prevalences are most likely to coincide among those with severe subnormality (IQ under 50). Before this age there are fluctuations in the known mentally handicapped population due to the time some disorders take to manifest themselves, the early deaths of some subnormal children, and the fact that children are not discovered to be subnormal in some cases until they begin to attend school. Kushlick reported a prevalence of 3.75 per 1000 aged 15-19 and this age group has been the most widely used subsequently for estimating prevalence.

Mackay and McDonald (1976) have pointed to a number of international studies that have reported rates throughout the 1960's and 1970's that are of the same order as Kushlick's findings. These similarities have generated a "steady state" theory in the field in which 3.7 per 1000 is seen to be a naturally occuring prevalence across the western world. Mackay and McDonald do suggest, however, that variations do exist that cannot be explained in

terms of deviations due to sample survey design or by the migration of mentally handicapped people towards areas of good service provision. They have found prevalences of 4.73 and 4.81 in survey of Northern Ireland seperated by ten years from each other. Table 2.3 shows the international comparisons that led to the steady state theory, and Table 2.4 the figures found for Northern Ireland in 1981. Table 2.4 also shows that considerable spatial variation can occur within regions, variations that have as yet no full explanation.

2.3 Registers of Disability

Registers form a final source of information on numbers of disabled people. Local authorities have had the ability to compile registers of the disabled since the 1948 National Insurance Act. By 1968 there were some 220,000 disabled people on their registers, only 7.1% of the impaired population (Harris,1971). One of the results of the CSDP surveys throughout the 1970's was a steady increase in the numbers of people registered, reaching 847,262 by 1978 (Hilditch,1981). Attitudes to registration vary greatly from local authority to local authority and between individual disabled people. There is no obligation on the part of the disabled person to become registered before they receive a service, with the exception until recently of eligibility to rate rebates. There is a general acceptance that registration figures are an inadequate source of information for epidemiological or planning purposes.

The registers maintained by the department of employment are prone to similar problems. The Manpower Services Commission (MSC) have pointed to decreases in the number of people registered as disabled for the purposes of employment as an illustration of disabled people regarding the system as irrelevant. They cite survey evidence which shows disabled people find registration a detrimental label rather than an important method of obtaining access to special help(MSC,1981). While this interpretation has been challenged by Jordon (1981) the fact remains that this register again provides an unreliable source of information on prevalence of disability among those of working age.

2.4 Age, Disorders, and Severity of Disability

Turning now to the demographic characteristics of the disabled population, and to the disorders they suffer, Harris and her co-researchers found that 64.7% of the handicapped population were 65 years of age or over, and that the majority of those identified as handicapped were women (Table 2.5). This pattern is confirmed by Townsend (Table 2.2), who found that 62.8% of those aged over 64 were appreciably, severely or very severely incapacitated. A comparison by age and sex of the Harris and Townsend findings is given in Figure 2.1. Both surveys show that the dominance of women in the disabled

Table 2.3 : Recent prevalence surveys of severe mental subnormality

Region		Age	Rate per 1000 of general pop'n
United Kingdom			
Middlesex (Goodman and Tizard,1962)		10-14	3.61
Wessex (Kushlick,1962)	County Boroughs	15-19	3.54
	Counties	15-19	3.87
Edinburgh (Drillien et al,1966)		7-14	5.00
North-East Scotland (Innes et al,1966)		15-19	3.70
Aberdeen (Birch et al,1970)		8-10	3.70
Northern Ireland (Mackay,1971)		15-19	4.73
National (Frew and Peckham,1972)		11	3.70
Other			
Sweden- Molndal (Wallin,1972)		15-19	4.78
Canada- Quebec (McDonald,1973)		10	3.80

Source: McDonald and Mackay (1976)

Table 2.4 : Prevalence of severe mental retardation per 1000 of the general population in Northern Ireland

Age	Area in Northern Ireland			
	Eastern	Northern	Western	Southern
0-4	0.86	0.55	0.87	0.92
5-9	3.03	3.03	4.47	3.09
10-14	4.05	4.06	4.24	4.51
15-19	4.01	4.86	5.58	6.09
20-29	4.07	4.82	6.10	6.37
30-39	4.03	4.47	6.57	5.51
40-49	2.25	2.76	3.15	2.72
50-59	1.72	2.28	1.58	2.29
60-69	1.05	1.65	2.21	2.22
70+	1.40	1.03	1.57	1.29

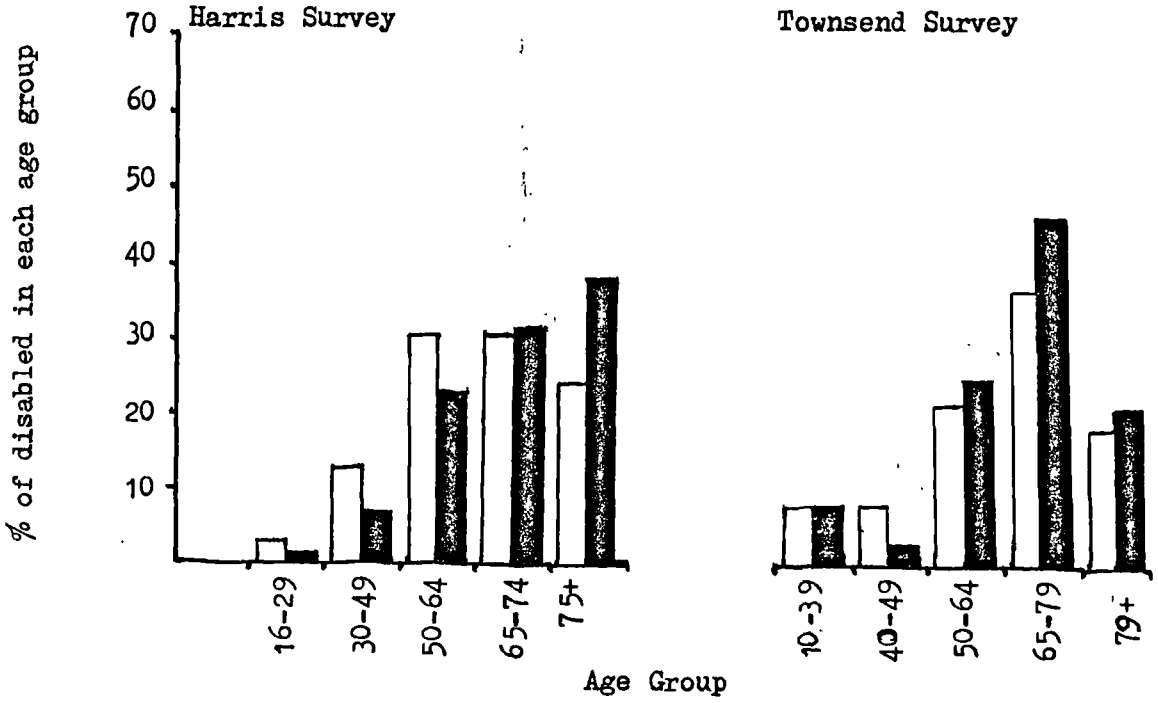
Source : McDonald and Mackay(1976)

Table 2.5 : Estimated numbers of men and women in Great Britain of different ages who are Very Severely, Severely or Appreciably Handicapped

Age Group	Men	%	Women	%	Men & Women	%
16-29	10000	2.7	9000	1.2	19000	1.7
30-49	45000	12.3	52000	6.8	97000	8.6
50-64	109000	29.9	172000	22.5	281000	24.0
65-74	111000	30.4	238000	31.2	349000	30.9
75 and over	89000	24.4	292000	38.3	381000	33.8
All ages	365000		763000		1128000	

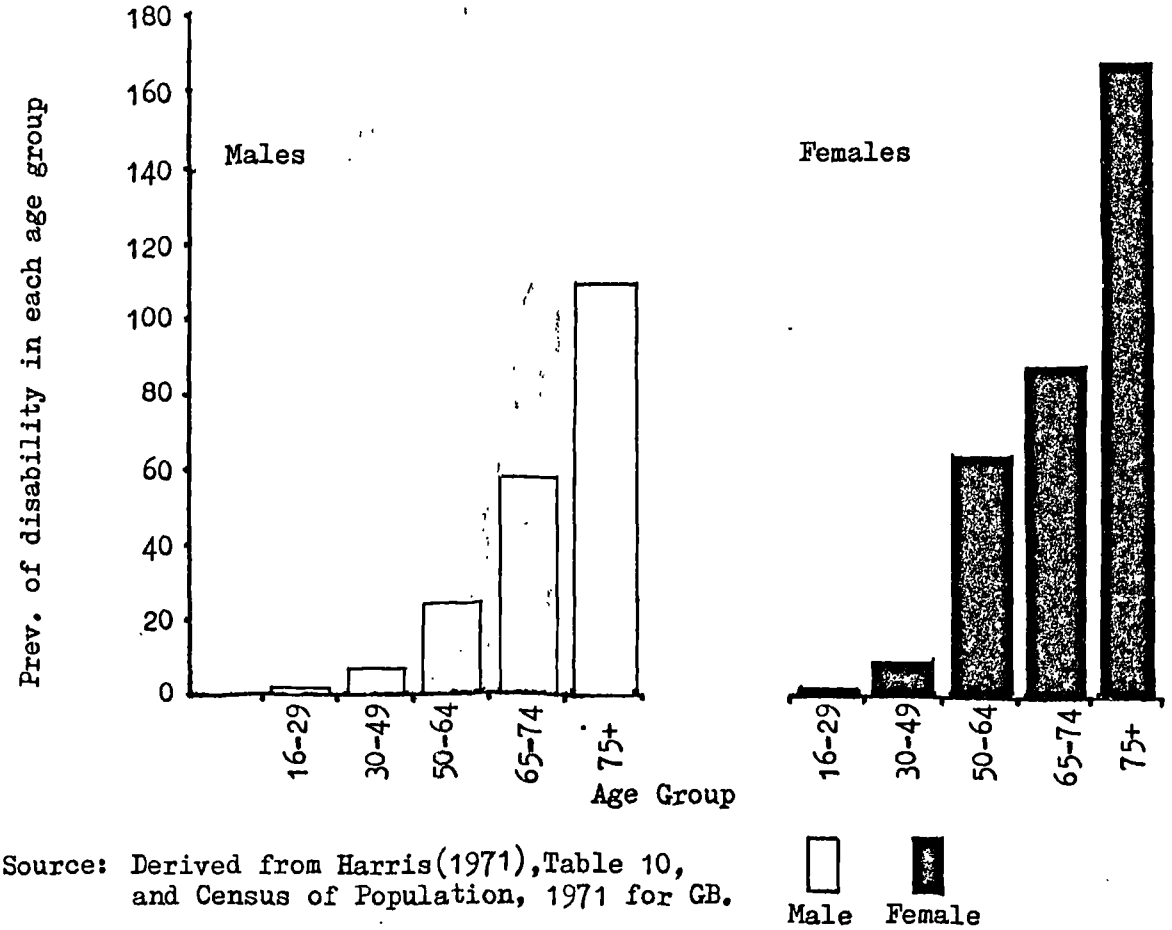
Source: After Harris (1971), Table 10, Page 18

Figure 2.1 : Comparison of the % disabled in each age group for Harris and Townsend Surveys



Source: Derived from Harris(1971),Table 10,pp 18 and Townsend(1979),pp 1055

Figure 2.2 : Prevalence of disability (per 1000 population)for each age group by sex from the Harris Survey



Source: Derived from Harris(1971),Table 10, and Census of Population, 1971 for GB.

population is not unified throughout the age groups. The main influence on this is the higher proportion of elderly disabled women in the disabled population. This is generally agreed to reflect the larger numbers of women surviving into old age compared to male survivors. This in turn leads to greater scope for the ageing process to effect the physical capacities of these women.

The increasing likelihood of disability with ageing is shown in Table 2.6, and illustrated graphically in Figure 2.2. Here the disabled population within each age group is expressed as a proportion of the total population to produce a set of age specific prevalence rates. For both men and women there is a four fold increase in the likelihood of disablement when one moves from the 30-49 age group to the 50-64 age group. This rate roughly doubles when one moves into the 65-74 age group, and doubles once more when one becomes 75 or over. Men and women aged over 75, are 15 and 21 times more likely to have an appreciable disability respectively than their counterparts aged 30-49.

Not only are the elderly more liable to be disabled than those of younger years , they are in general more likely to be more profoundly effected by their disability than those disabled in earlier life. Table 2.7 is based on Harris's work and shows the proportion of each age group in the population with varying severities of disability. It is noticable that among those aged 75 and over there are higher proportions of their number in the very severe, and severe categories than is found for other age groups, irrespective of sex. It is also noticable that higher proportions of disabled women are in the very severe and severe categories than are men of the same age. Townsend notes this trend in his study, and in his case finds that it was related to higher incidence of incapacity due to mental anxiety among women (Townsend,1979;pp705-6). In the Harris survey the major difference seemed to be related to be an increased likelihood of severe disorders of the bones and organs of movement.

The number of diseases and disorders causing disability was found to be very wide. The disorder affecting the greatest number of people was arthritis suffered by 28.4% of those impaired. The nearest disorders in terms of number of sufferers were disorders of the eye with 6.9% of those impaired, and strokes, coronary disease, bronchitis and amputations, each affecting 4.2% of those impaired.

Figure 2.3 shows the diseases that affected the largest number of disabled people. Apart from Arthritis, the disorders of bones and of movement represent 10% of all disabilities. These are generally speaking the disorders that affect the elderly the most, being the products of mechanical wearing of the body sustained over many years. Figure 2.3 shows, however, that Arthritis is not on the

Table 2.6 : Estimated prevalence of appreciable, severe and very severe disability (per 1000 population) for each age group

Age	Prevalence per 1000 population Men	Women
16-29	1.9	1.7
30-49	6.9	8.0
50-64	23.7	34.3
65-74	57.5	89.0
75+	110.3	168.9

Source : Calculated from Harris(1971), Table 10, pp18 and Census of Population, 1971 for GB.

Table 2.7 : Estimated numbers of men and women in Great Britain by age and severity of handicap

Age Group	% Severity of Handicap					
	Very Severely		Severely		Appreciably	
	M	F	M	F	M	F
16-29	4.3	6.2	3.4	6.2	11.6	11.2
30-49	2.7	6.2	5.6	11.1	14.3	15.8
50-64	2.7	3.5	8.1	14.2	16.5	22.0
65-74	2.6	4.6	7.7	13.2	20.8	24.6
75 and over	7.1	10.1	11.4	15.6	18.3	21.0

Source: After Harris (1971), Table AX, pp 236

whole a major source of very severe disability, affecting as it does only 4% of the disabled (Harris,1971;Tables AV and AVI). Figure 2.3 shows that Strokes and Senility are much more serious in their effects on individual sufferers, even if in global terms they affect many fewer people. Table 2.8 shows the disorders that have the most profound influence on sufferers. Multiple Sclerosis and Parkinson's Disease join Strokes as the most debilitating , 65%, 52%, and 52% of their victims respectively being classified as either severely or very severely disabled.

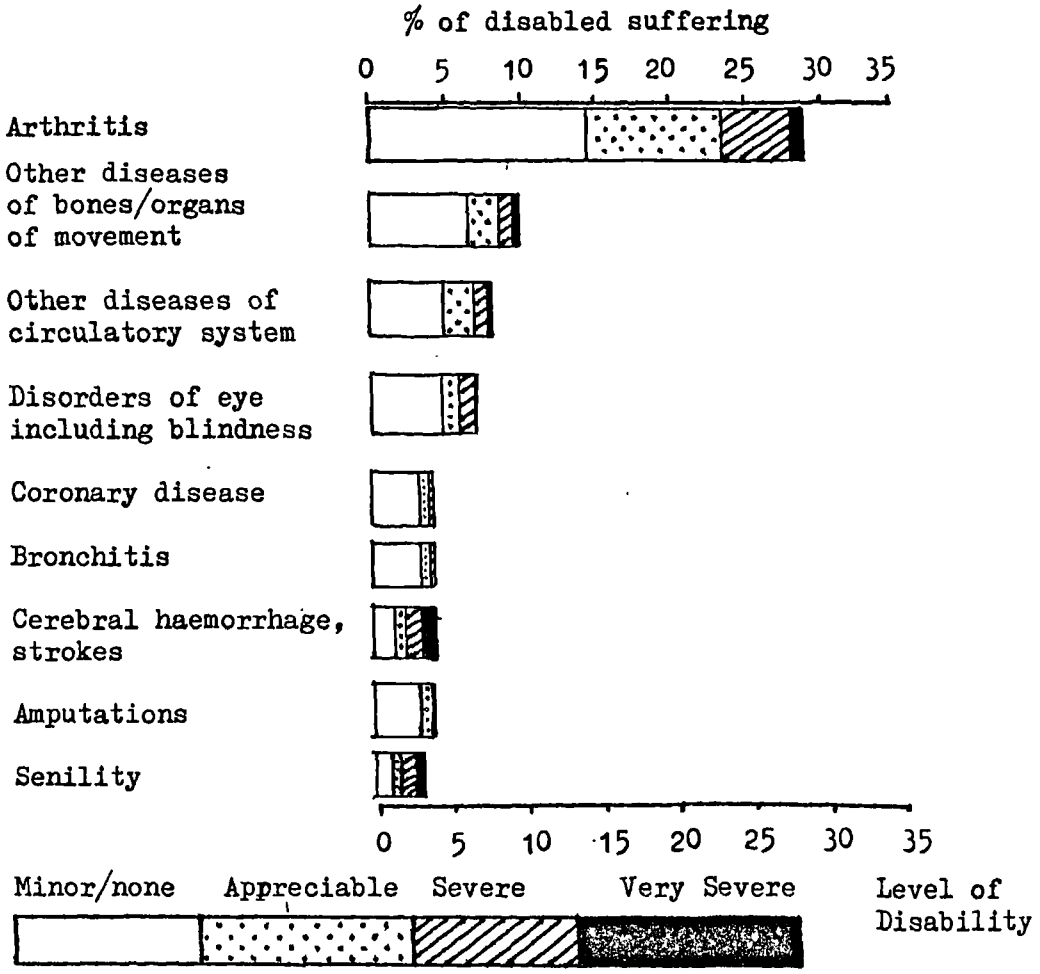
A number of authors have pointed to the disparity between the reported importance of disability among the elderly, and the general lack of awareness in society of the fact. There also appears to be a acceptance of chronic ill health among the elderly as a natural state rather than as a disablement (Hunt,1978; Walker,1980,1983; Townsend,1979; Topliss,1983). Walker (1980,1983) has argued that the exclusion of the elderly from common conceptions of the disabled has been legitimated by the state, and has had a detrimental influence on policy directed at improving the quality of life of the disabled in general. Firstly the exclusion of the elderly has led to the dominant public image of the disabled person as a person in a wheelchair, or as an amputee (Weir,1981). This has in turn lead to the conceptualisation of the problem of integrating people with disabilities into society, as merely technical problems relating to physical access, rather than more fundamental issues relating to social structures, and poverty.

Secondly the elderly, however they are conceived of, are themselves a relatively poor group with large proportions of their number living around the poverty level (Walker,1980). The division of people with problems into "the elderly", and "the disabled" has obscured the financial plight faced by those of all ages who suffer from a disability of some kind. Walker argues that the retired elderly are not viewed chronologically by society, but in relation to their detachment from the labour market. Work is seen as the primary source of assigning status to individuals, with those outside of the labour market being labelled as dependent, and therefore worthy of only minimum levels of support. As "dependent" it becomes far easier to view the onset of disability as of little additional significance. In relation to the elderly, they are already labelled as dependent, with the connotation of being inefficient and unproductive, and the presence of actual impairment adds little information in status terms. Disablement has been absorbed as part of the dependent role of the elderly with the afore mentioned results for policy aimed at the disabled.

2.5 Spatial Patterns of Disability

The Harris survey uncovered a number of interesting regional patterns among the disabled. The proportion of

Figure 2.3 : Proportion of those identified as impaired suffering from specific diseases, with degree of disability resulting



Source: Derived from Harris(1971), Table AIV,pp 227-8

Table 2.8 : Illnesses and conditions with the highest proportion of very severely or severely handicapped people

Condition	Proportion suffering who are very severely/severely handicapped %
Multiple Sclerosis	65
Parkinson's Disease	52
Strokes (Cerebral Haemorrhage)	52
Paraplegia	34
Spastic (Cerebral Palsy)	24
Arthritis	20

Source: Harris (1971), Page 20

the population suffering from a disability ranged from 24.7 per 1000 in the South East to 33.3 in the North and to 40.1 in the South West (Table 2.9). Both the South West and the North have high levels of handicap among both men and women. East Anglia however, has the lowest levels of handicap among men but still has a high level among it's women.

There are notable differences in the degree of handicap experienced by those identified as such within regions. The proportion suffering very severe handicap varies from 4.2% to 7.9% in Great Britain. Map 2.1 shows that the highest prevalence rates for handicap are to be found in Wales and in the South West, Scotland and the East Midlands.

The Knight and Warren report also identified spatial differences in handicap prevalence. They noted that, despite the sample being unrepresentative of all regions:

> "...the differences between some areas are so striking that even after making allowances for differences in approach there is evidence of considerable local variation. The high rates, particularly for men below retiring age, in areas with heavy industry, such as Walsall, Rotherham and Leeds , contrasted with those in London and the South-East, except for Kensington and Chelsea".
>
> Knight and Warren(1978,pp46-47)

The examination of prevalence rates within the Greater London area illustrates that marked differences exist even within regions. Table 2.10 shows that prevalences vary from 15.7 per 1000 total population in Havering to 33.9 per 1000 in Kingston-on-Thames. Prevalences for Walsall, Rotherham and Leeds are included for comparison.

Local authority CSDP surveys have not generally provided any detailed information on patterns of handicap within local authority areas. The reason for this omission are to be found in the methodology of the surveys themselves. Brown and Bowl(1976) have shown the types of surveys that were carried out subsequent to the CSDP Act. Of 152 local authorities providing information on this topic, 58% were sample surveys or 100% household surveys of only part of a local authority area. 82% of these 100% surveys of partial areas covered less that 20% of the total local authority area making spatial patterning difficult to detect. Further more, many of the sample surveys undertaken used the Harris methodology officially modified for local authority use and supported by the DHSS (DHSS,1970). This modification recommended that a two stage sampling method be used. Here the researchers were to select electoral wards and parishes, and rank them by the total number of electors present. smaller wards were joined with other contiguous wards to form

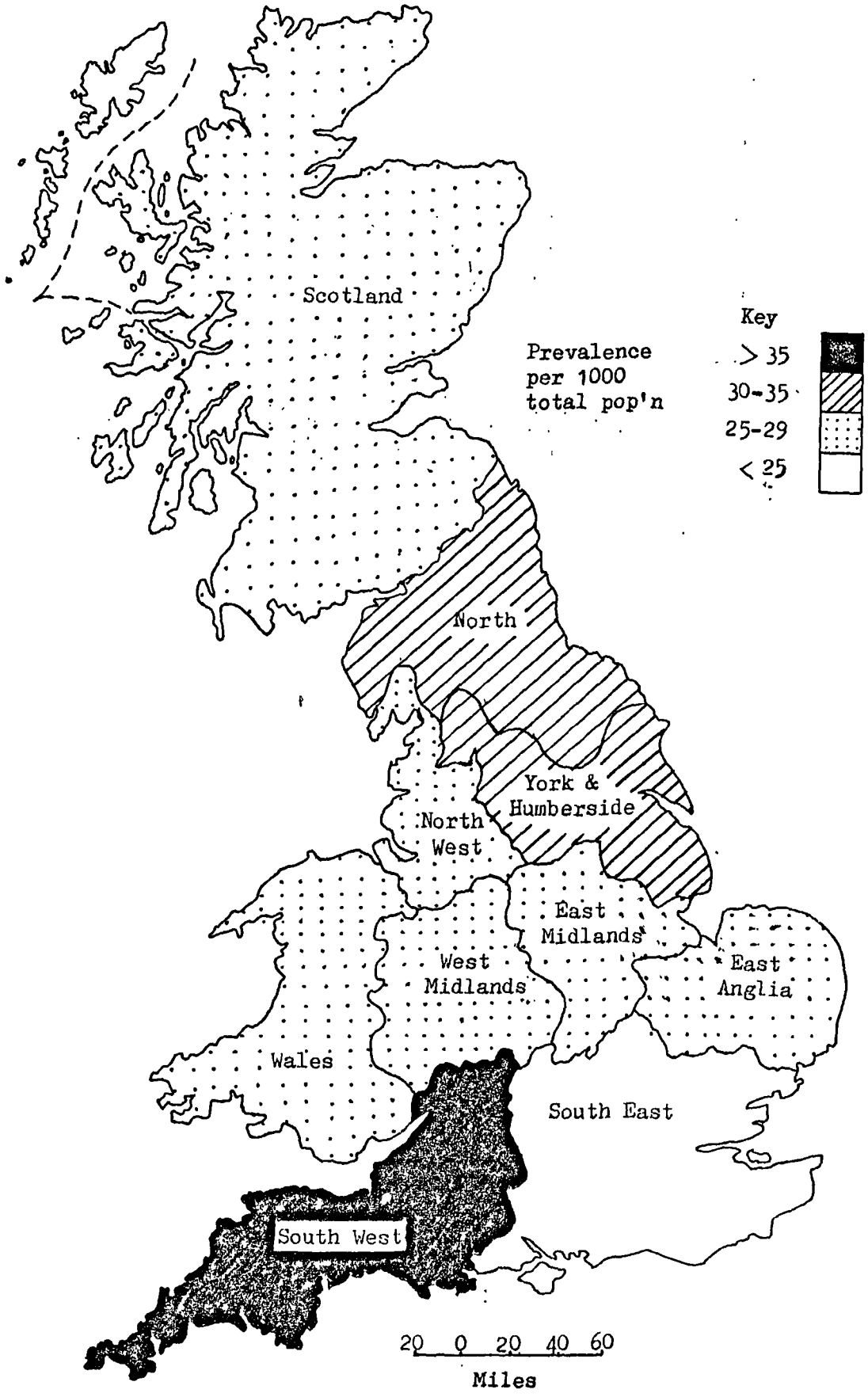
Table 2.9 : Proportion per 1000 of men and women in each area who are Very severely, Severely, or Appreciably handicapped

Area	Proportion per 1000 (1)			Proportion of Impaired in each handicap category (2)			
	Men	Women	Men & Women	Very Severe	Severe	Appreciable	Minor/None
Northern	22.1	41.7	32.3	5.0	12.1	22.1	60.8
Yorkshire & Humberside	24.3	39.1	32.0	4.2	10.9	20.8	63.8
North Western	19.3	38.0	29.2	4.8	11.5	18.7	65.1
East Midlands	16.6	33.9	25.5	5.8	12.2	18.0	64.0
West Midlands	17.7	36.9	27.5	4.8	11.1	21.4	62.7
East Anglia	13.2	40.4	27.2	4.3	11.7	17.0	67.0
South Eastern (Excl. Greater London)	15.8	32.6	24.7	5.3	12.4	19.2	63.4
Greater London	17.0	34.2	26.1	4.3	9.9	21.5	64.3
South Western	30.4	48.7	40.1	5.8	14.0	22.9	57.8
England	19.2	37.2	28.6	4.9	11.6	20.3	63.1
Wales	24.9	31.8	28.5	7.9	9.6	15.2	67.4
Scotland	19.7	36.9	28.8	5.8	12.8	20.8	61.0
Great Britain	19.5	36.9	28.6	5.1	11.6	20.1	63.2

Source: (1) Harris (1971), Table 12, page 19

(2) Derived from Harris (1971), Table 11, page 19

Map 2.1 : Prevalence of Disability by Standard Regions (pre-1974 boundary)



Source: Derived from Harris(1971), Table 12, Page 19

Table 2.10 : Prevalence of severely and appreciably handicapped people identified in local authority CSDP Surveys

	Rates per 1000 of -	
	Total population	Non-retired males
Havering	15.8	
Merton	30.9	
Kingston-on-Thames	33.9	
Barnet	26.9	
Bromley	20.9	
Lewisham	23.1	
Waltham Forest	29.7	
Westminster	27.9	
Kensington and Chelsea	27.2	
Walsall	31.3	
Rotherham	26.1	
Leeds	16.6	

Source: Knight and Warren(1978), Table B10,pp 103

Table 2.11 : Prevalence of disability in Health and Social Services Districts in Northern Ireland

Health & SocialServices District	Rates per 1000 of Total Population
North & West Belfast	32
East Belfast & Castlereigh	33
Down	30
North Down & Ards	38
South Belfast	32
Lisburn	
Newtownabbey	28
Antrim & Ballymena	28
Magherafelt & Cookstown	35
Larne & Carrickfergus	25
Coleraine, Moyle & Ballymoney	30
Dungannon & Armagh	39
Craigavon & Banbridge	32
Newry & Mourne	42
Omagh	40
Londonderry, Limavady & Strabane	
Fermanagh	52

Source : Outset(1983)

units of approximately 1500 electors. For local authorities with over 100,000 electors, wards were sampled on the basis of one ward in two, three or four depending on total size. This ranking process was suggested to ensure a representative sample of large and small wards emerging from the first stage spatial sampling procedure. The advice to researchers was to start with the area having the largest population to avoid missing :

> "..wards that are very much bigger than others in the county, and so missing an area where there might be a geographical concentration of (disabled) people".
>
> Harris and Head (1971,pp14;note 1)

This advice implies an expectation that observed numbers of disabled will be directly related to population size in an area. If however, disabled people were to be spatially concentrated in large numbers in one or two wards the one in two,three or four sampling procedure can potentially seriously miscalculate overall prevalence. Evidence presented later in this chapter suggests that disabled people can indeed be found in concentrations in small localised areas within local authority boundries.

It is clear that 100% household surveys have the potential for overcoming any flaws inherent in the spatial sampling approach suggested by the DHSS. Indeed a significant number of surveys carried out under the auspices of the Chronically Sick and Disabled Persons Act were of the 100% household coverage type. However a number of 100% full area studies which could have provided information on variation within areas only involved the distribution of publicity material concerning services available to the disabled. Brown and Bowl commented that there was a tendency among those 100% household surveys that did try to identify on a 100% basis, to apply inadequate definitions of disablement in screening the population. As a result :

> "The Authors consider, that overall, the local authority studies have under-estimated the true numbers of chronic sick and disabled in their areas, where they have attempted 100% coverage".
>
> Brown and Bowl(1976,pp33)

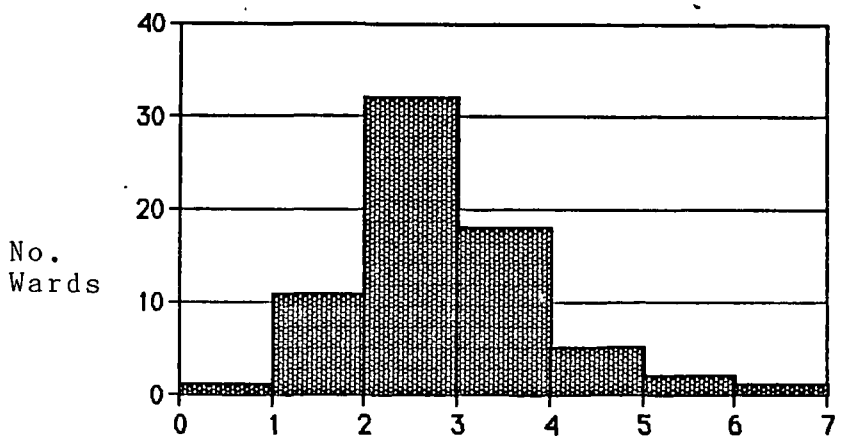
A number of more recent surveys provide an opportunity to identify differences in intra-urban disability prevalence rates, as well as variation within local authority boundries. A survey of the 17 Health and Social Services Districts in Northern Ireland (Outset,1983a,1983b) presented information on the prevalence of disability in wards and parishes in the Province. A summary showing prevalence rates for each of the 17 Health and Social Services Districts is given in Table 2.11. Rates range

from 25 per 1000 in Larne and Carrickfergus, to 52 per 1000 in Fermanagh.

Just as interesting spatial patterns exist within District boundries. Figure 2.4 shows the distribution of prevalence rates within Belfast, made up of the Districts of North & West, South, and East Belfast & Castlereigh. Prevalences range from 0.9% in Hillfoot ward to 6.1% in Bloomfield ward and these are shown in Map 2.2a. The map confirms that there can be localised pockets within urban areas where high prevalences of disability are to be found, the reasons for which are as yet unclear.

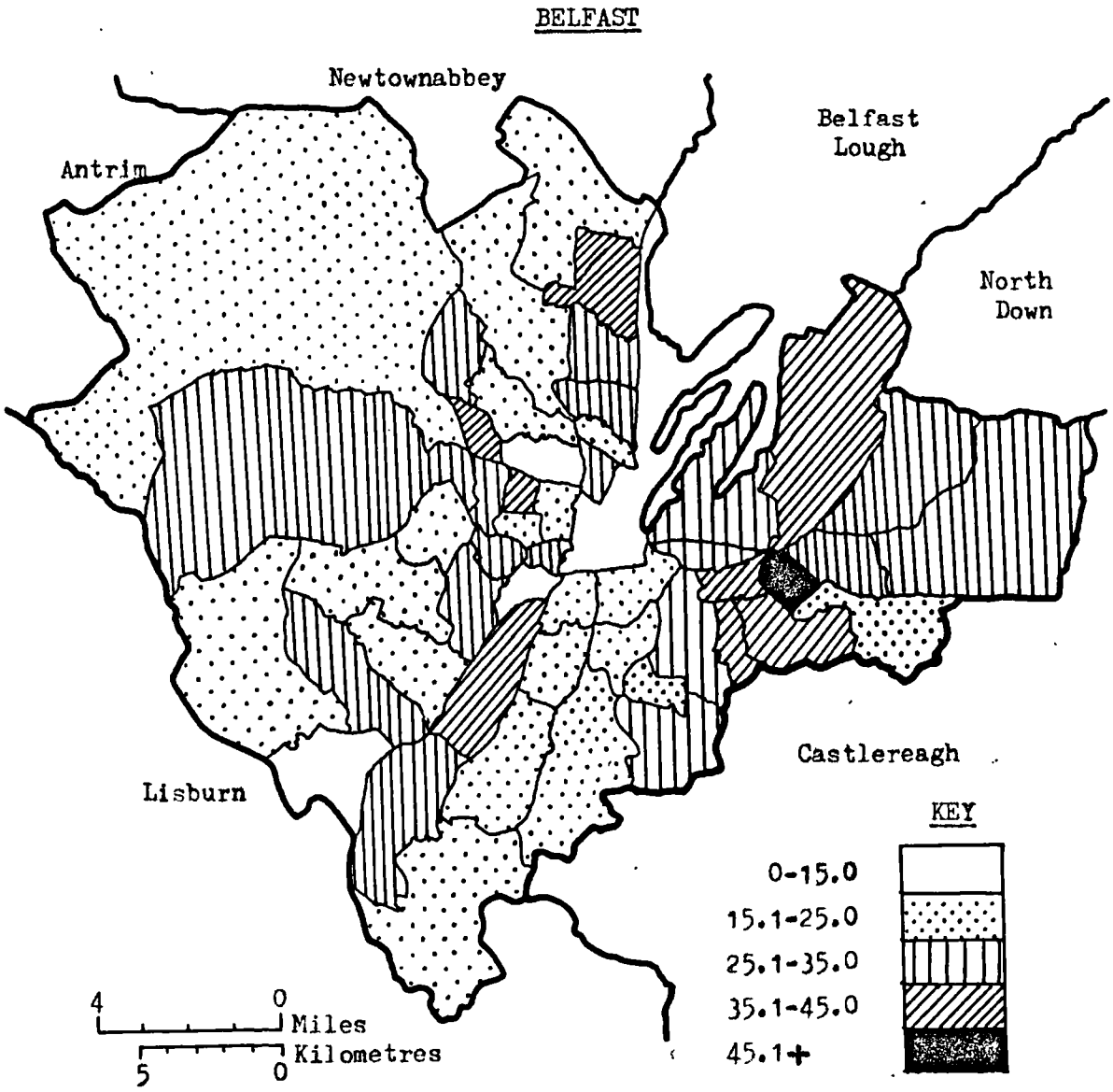
What is clear is that for methodological reasons stemming from official government policy, little information exists on variation in disability within local authority areas. The evidence that does exist points to there being variation present at this scale. This is important when looking at the spatial variation of handicap, and the influence of location on quality of life. The importance comes from the fact that the majority of services that have a day to day impact on disabled people at home, such as personal support services, are coordinated at this scale through social services departments. If patterns exist in base level disability within local authority areas, and local health and socal services fail to operate in ways that focus resources on areas of great need, then territorial injustice will be the result. In the context of disability it may be argued that, if resources do not match needs, then the pattern of unfulfilled need will represent a pattern of handicap.

Figure 2.4 : Distribution of disability prevalence rates for electoral wards in Belfast



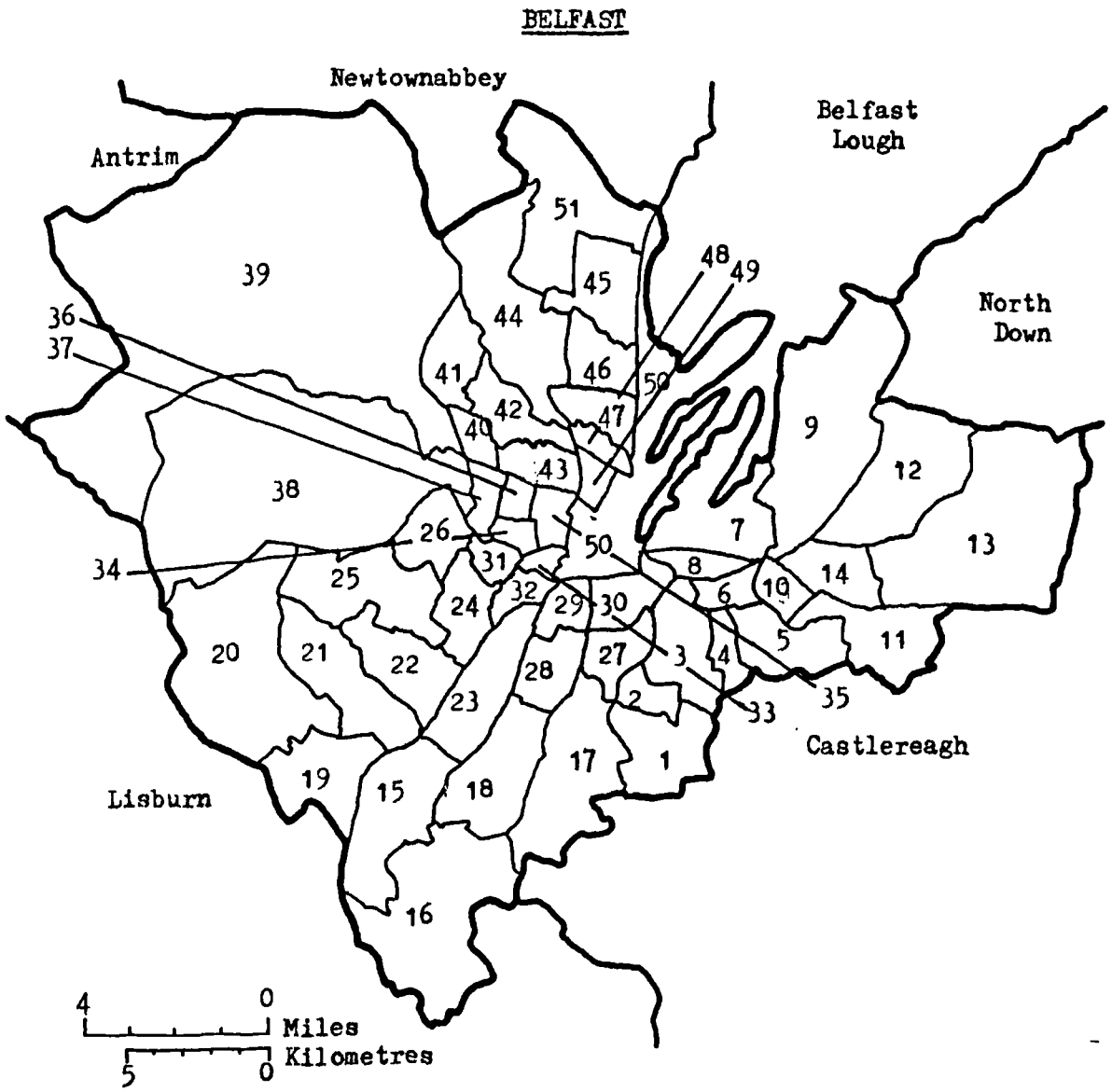
Source : Outset (1982a,b,c)

Map 3.2a : Prevalence of disability across wards in Belfast per 1000 of the general population (1971)



Source: Outset (1980)

Map 2.2b : Key to ward names within Belfast.



1. Rosetta
2. Ballynafeigh
3. Ormeau
4. Willowfield
5. Orangefield
6. The Mount
7. Island
8. Ballymacarrett
9. Sydenham
10. Bloomfield
11. Shandon
12. Belmont
13. Stormont
14. Ballyhackamore
15. Finaghy
16. Upper Malone
17. Stranmillis
18. Malone
19. Ladybrook
20. Suffolk
21. Andersonstown
22. Milltown
23. Donegall
24. St. Jamess
25. Whiterock
26. Highfield
27. University
28. Windsor
29. St. George's
30. Cromac
31. Clonard
32. Grosvenor
33. Falls
34. North Howard
35. Court
36. Shankill
37. Woodvale
38. Ballygomartin
39. Legoniel
40. Ardoyne
41. Ballysillan
42. Cliftonville
43. Crumlin
44. Cavehill
45. Castleview
46. Fortwilliam
47. Grove
48. Duncairn
49. New Lodge
50. Central
51. Bellevue

CHAPTER 3

HANDICAP AND TERRITORIAL JUSTICE IN SERVICE PROVISION

3.1 Territorial Social Justice

While the spatial distribution of social need has received much attention during the 1970's (Smith,1977), the distribution of resources to meet such needs has drawn less attention. While substantial contributions have been made by geographers in the field of health care, the analysis of other welfare delivery systems such as social services provision, has generated less interest (Pinch,1979). The potential for mismatch between the needs generated within areas, the resources provided to overcome these needs, and what constitutes a "just" reconciliation of the two, has been discussed by Davies (1968), and Harvey (1972). Davies has suggested that an ideal criteria should be that the correlation between an index of need in an area, and an index of appropriate provision should be perfect (Davies,1968,pp 39). Harvey has gone further to suggest that a territorially just distribution of income, in the widest sense, should be such that needs of the people in each area should be met, and that extra resources are allocated to help overcome special difficulties arising from the physical or social environment. This is important, as a set of just distributions based on indicators of need for an area will not necessarily guarantee that there is a just distribution of resources within the area.

Pinch (1979) has taken up the ideas of territorial social justice in the context of social services provision for the elderly. In that study he was able to compare a set of normative measures of need for services with a number of resource measures of health and social services provision. In choosing these, Pinch pointed out that there are three types of resource measure. These are inputs (usually in the form of financial inputs), provision levels (in the form of physical provision of care sessions, beds, or meals-on-wheels), and outputs (in the form of reduction of difficulty, or a better quality of life). The measures related to input were seen to be problematic as it is often difficult to identify reliable measures of financial input to service networks. Provision measures could take two forms, extensiveness, and intensity. Extensiveness usually takes the form of the proportion of potential clients actually being served, and intensity the form of physical service provision as a rate per 1000 population or per head. Finally outcome measures, while the most desirable, are at the same time the most difficult to collect. These involve evaluation of what the service is trying to achieve in terms of the services effect on the individual client. It has the advantage of side-stepping the problem of ecological assocation between aggregate service input not actually being the same as client experience of the service. Pinch (1979) used financial indicators showing the amount being spent on selected

services to represent the response to need across Greater London.

In the same way, as there are several methods of measuring service input, there are a number of different ways of identifying the "need" for a service. Bradshaw (1972) has pointed out four types of need- Normative, Felt, Expressed, and Comparative need. In the study of local authority performance, normative approaches are more usual because of their reliance on aggregate statistical measures. This was the approach taken by Pinch (1979), population characteristics from the census reflecting the distribution of the elderly. Felt and Expressed needs are those directly experienced by the client, the first being the need for a service expressed to a third party, usually via questionnaire. Expressed need differs from Felt need in so much as the client both says that they have a need for the service, and makes a direct attempt to obtain the service. Comparative need is usually based on an analysis of the relative situations of potential recipients, with some concept of priority being applied to competing cases.

Bradshaw's approach to the various levels of need is clearly relevant. In the context of disabled people, therefore, there are a number of possible relationships that can be examined to established whether territorial just situations are being created. At one level one may look at normative patterns of need, as in statistical distributions of populations thought to be in need, and match this with measures of resources inputs to service, or aggregate levels of provision of services across the same areas. At this level there is no direct relationship between the "inputs" and the people in need. If, however, one wishes to look at territorial justice in terms of Felt, Expressed, or Comparative Need, one has to look directly at the individuals concerned, and resource or provision directly to them.

Much of the responsibility for personal care of the disabled lays at local authority level. As geographers little information has been available on which to measure equality of provision at this important spatial scale, for any client group or any measure of need. Where studies of local authority welfare provision have been carried out it is mainly been at the inter-local authority scale, and here wide differences in levels of provision have been recorded, although mostly without a comparison with any levels of need. These studies have suggested that the quality of one's life as a disabled person depends not merely on one's disorder and disabilities, but on which local authority one happens to live in. At the inter-local authority scale there remains a need for more study of inequality of provision. The work that has been done does prompt a further question: "Is the location of a disabled person within a local authority influence their level of service provision, and therefore their quality of life and experience of handicap?". In this Chapter an attempt is made to look systematically at inter-local authority service provision

for disabled people in the context of "normative" need. This exercise provides a context for the examination of territorial justice within a local authority, based on a comparison of felt need and direct provision of services to individuals. This is presented in Chapter9, and is based on a survey of the disabled in the London Borough of Barnet.

3.2 Spatial Patterns of Handicap

Few of the studies mentioned so far have been concerned with what the World Health Organisation has defined as disability and not with handicap. The only study that has to date attempted an assessment of levels of handicap in this sense is a study of Lambeth in London (Patrick,1981). Unfortunately this study did not have spatial variation as a key element in its methodology. As discussed in Chapter 1, handicap can be viewed not only as a state determined by the individuals physical limitations but by societies attitudes to disability, and by the level of help available in maintaining personal autonomy. Spatial patterns of disability are dependent on spatial distributions of people with impairments. The loss of role experienced or the drop in quality of life can be related to the pattern of help available, or to the distribution of restrictive environments. Spatial variation in handicap can, therefore, be interpreted as spatial variation in opportunity. Patterns of relative disadvantage can be a function of spatial variations in societal attitudes to the disabled, environmental limitations on them, levels of personal social services to them, and spatial differences in income maintenance or suitable employment for the disabled.

3.3 Spatial Variation in Attitudes

Information on spatial variation in social attitudes towards the disabled is limited. Three studies were reported by Yuker(1970) in this general area, all relating to urban and rural differences in attitudes to the disabled. The first by Roeher(1959) reported a Canadian example where urban residents were found to exhibit more favourable attitudes towards disabled people when measured on a Likert Scale. This urban rural split was confirmed by Bateman (1962) in a study of 92 sighted children without knowledge of blind children. Urban children had significantly more positive views on the capacities of blind children than did rural children. Finally Lamers (1965) found that when high school students of a small urban community of population less than 2500 were compared in their attitudes to disabled with similar students from a city of over 10,000 residents, the small town students were found to respond more favourably. While no systematic theories of spatial differentiation in attitudes have emerged, it is clear that there differences can and do exist, and these may have an effect on the life chances of disabled people living in different urban and rural environments.

3.4 Spatial Variation in Services and Physical Environments

A number of surveys relating to restrictive environments exist and include the physical accessibility of facilities such as shops, libraries, leisure centres and government buildings. While these are available they are difficult to compare in any systematic way due to the methods used and to the different range of facilities covered. There are however readily available statistical sources on the level of provision of personal social services and special housing for the disabled which can give some indication of spatial variation in community response to disability. These aggregate statistics are open to criticism because of their secondary relationship to actual need for services on the ground.

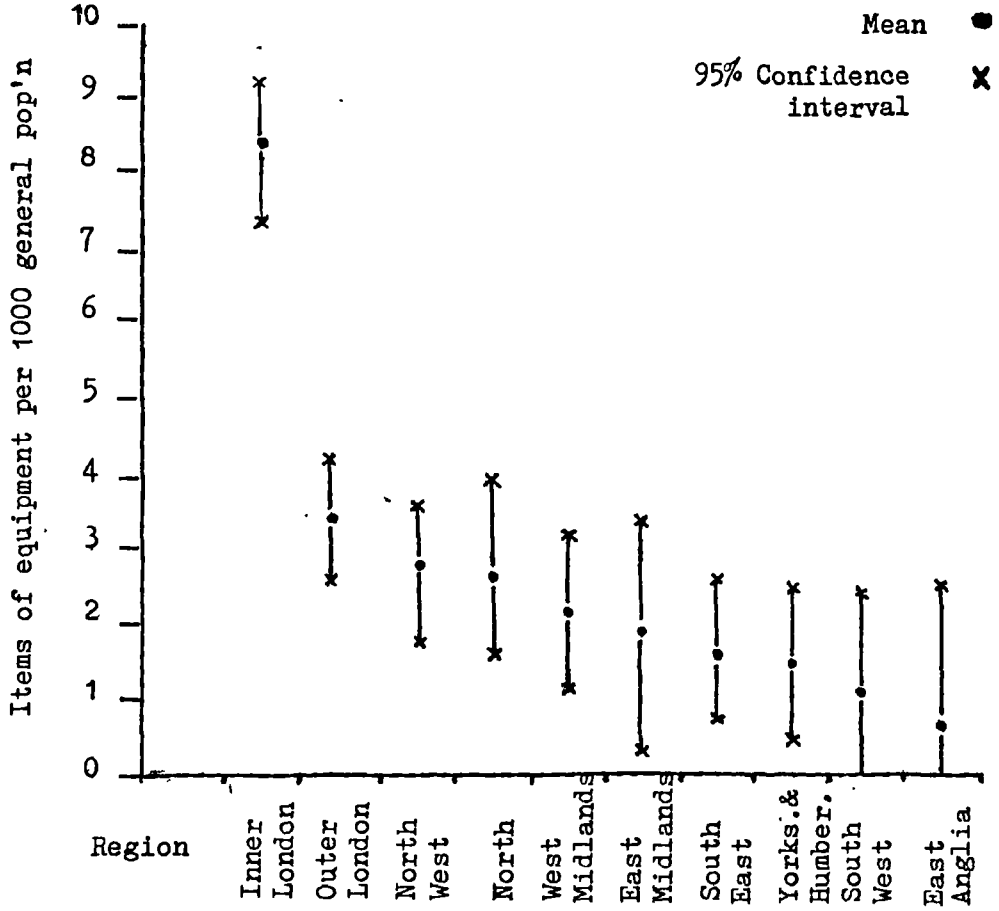
In spite of this criticism, comparisons of aggregate levels of support provided by local authorities to the disabled has been attempted with varying levels of sophistication and comment made on the disparities that emerge. The Disability Alliance (Kebble,1985) have made some attempt to apply statistical analysis to the problem of drawing conclusions from aggregate service level data. In this section an attempt is made to take this approach further, and provide some level of comparison of provision to normative levels of need.

Local Authority Social Services Departments provide statistics on services provided under the CSDP Act to central government. Appendix 1 shows the level of provision of aids for personal living, and adaptations carried out in private homes, and communications equipment for all authorities having a duty to provide them. Figures 3.1 to 3.3 show the range of provision among these authorities on a regional basis. The regions are themselves presented in order of the number of very severely, severely, and appreciably handicapped people estimated to be living there by the last National Survey (Harris,1971). The Harris figures for regional prevalences of disability are for 1968/69, and there are obvious problems in comparing these figures with more recent provision figures. While there is no evidence to suggest that the relative rankings of the regions has changed, only a broad comparison is attempted here.

An analysis of variance can be performed on the three sets of regional data. An analysis of variance in this case determines whether the average rates of provision for each region are statistically different in relation to the variation in rates of provision within the regions. Ultimately the variation between regional mean rates of provision is expressed as a proportion of total within region variations, thereby forming an F statistic.

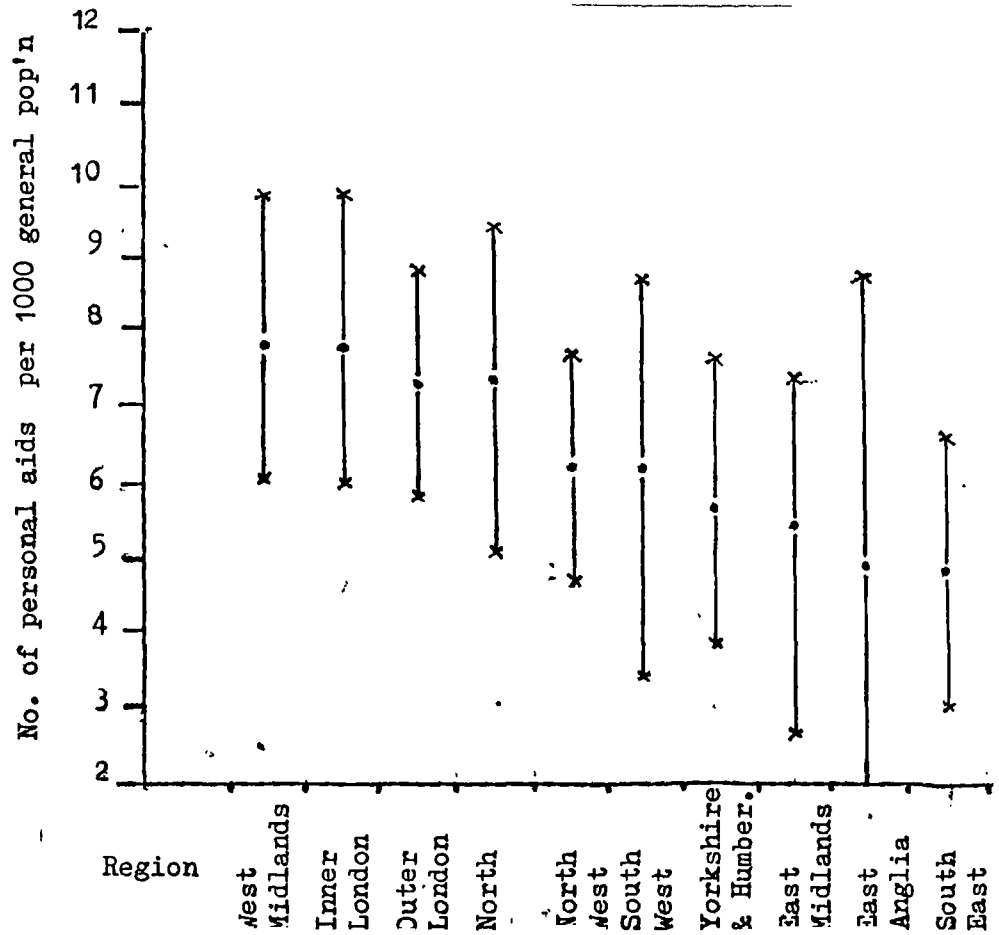
If a significance level of 0.05% level is selected, a critical value for F is 1.97. The analysis of variance for this data is given in Table 3.1 and significant values of F are found for the differences in provision of communications equipment for the disabled, and for the provision of adaptations to private homes (e.g. ramps and

Figure 3.1 : Range of provision of communications equipment for the disabled for local authorities grouped by region



Source: C.I.P.F.A. (1978)
See Appendix 2
for raw data

Figure 3.2 : Range of provision of aids for the disabled for local authorities grouped by region



Source: C.I.P.F.A (1978)
See Appendix 2
for raw data

Table 3.1 : Analysis of variance for regional variation in local authority provision of aids, adaptations and communication equipment

	Source	Degrees of Freedom	S S	M S	F	
Communications	Region	9	478.82	53.20	11.78	*
	Error	98	442.47	4.52		
	Total	107	921.29			
Aids	Region	9	125.4	13.9	0.92	
	Error	95	1443.2	15.2		
	Total	104	1568.6			
Adaptations	Region	9	10.2	1.14	3.01	*
	Error	96	36.24	0.38		
	Total	105	46.47			

* Significant at the 0.05% level

Source: C.I.P.F.A. (1978), See Appendix I for raw data

ground floor extentions). Notable "outliers" from the mean levels of provision are Inner London for communications equipment(which includes telephones)(Figure 3.1) and Outer London for adaptations (Figure 3.3). There appears to be no significant regional differences between local authorities in the provision of personal aids (e.g. raised lavatory seats, aids for eating and dressing etc.) The within region variance for this measure is, however, very large (1443.2), in relation to other items of provision. Plots of individual regional variations in Figure 3.2 would indicate that comparison of constituent local authority provision of personal aids would reveal very large differences.

The ranking of regions in relation to provision of services may be compared to their "ranking" in relation to the prevalence of disability in each area using rank order correlation. A null hypothesis may be formed that there is no significant relationship between the prevalence of disability in a region (as measured by Harris(1971)) which may crudely be interpreted as the level of demand for services, and actual levels of provision. The results are shown in Table 3.2, and show that taking the 95% level, no significant association does exist between provision and levels of handicap in the regions.

These figures are indicative of there being factors other than individual need determining the levels of service provided. The two sets of figures used are ten years apart, and as has been stated previously, the implication that needs are not being fulfilled in some local authorities is of an ecological nature by the aggregate nature of the data. However, the finding does broadly support the work of others who have reached the same conclusions. Similiar figures have been used by writers to support an argument that the quality of life of disabled people is effected by the area they live in rather than directly by the problems they face (Shearer,1981b,pp77; Mole,1978; Keeble, 1985).

Shearer has explained these discrepancies by reference to the fact that the CSDP Act leaves a great deal of discretion with that local authority. She identifies three factors influencing under provision. Firstly the surveys carried out under the CSDP Act to identify need have not generally identified individuals in need as the Act's creators had hoped, but have concentrated on sample studies to identify aggregate levels of need. This approach had the support of the DHSS (DHSS,1970), who openly stated that 100% identification should not be the aim of these surveys, and warned against raising expectations by seeking out needs which could not be met. Although subsequently revised, this advice had a great effect on early surveys attempting to identify needs.

Secondly, the CSDP Act did not lay down standard definitions of disability. This allowed local authorities to choose whom they included on registers and what they defined as a need for a service arising out of

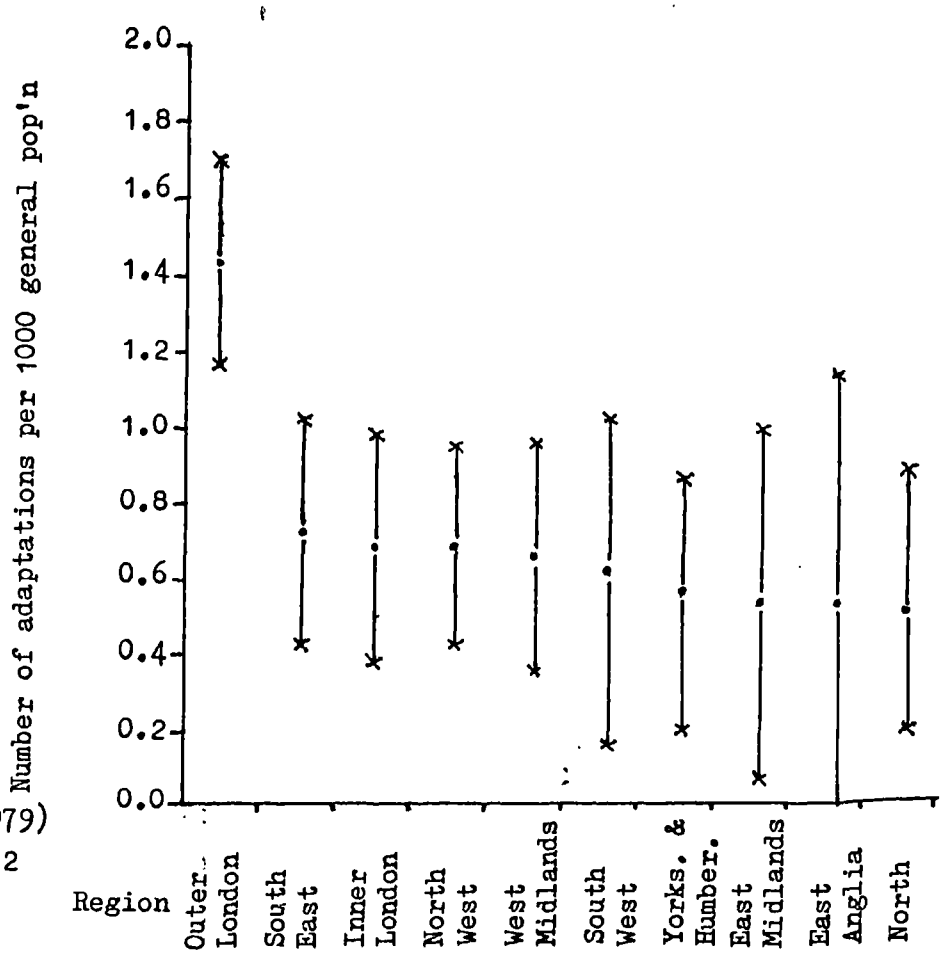
Table 3.2 : Rank Order correlations between estimated regional number of disabled people and levels of service provision

	Pearson Rank Order Correlation Very Severe, Severe, Appreciable Disabled
Communications Equipment	0.215 o
Aids	0.217 o
Adaptations	0.463 o

o NOT significant at 0.05% level

Source: C.I.P.F.A. (1979), See Appendix 2 for raw data

Figure 3.3 : Range of provision of adaptations for the disabled for local authorities grouped by region



Source: C.I.P.F.A. (1979)
See Appendix 2 for raw data

disablement. Indeed, rather than advocating objective criteria for service eligibility, the DHSS in their Circular 12/70 stated that:

> "Criteria of need are matters for the authorities to determine in the light of resources".

Help for the disabled has not then been seen as a matter of right by need, but as a commodity dependent on what resources councils wish to allocate to the disabled.

Thirdly, Shearer points out that public expenditure cuts over the last seven years have fallen to a disproportionate extent on services for the disabled. It is easier for authorities to make cuts in services that are non-mandatory, as in effect CSDP Act services are, than to attack those with a firmer statutory backing, such as in the child care field (Shearer,1981; Wilson,1980; Wright,1977; Walker and Ormerod,1979).

The impact of such cuts on spatial differences in service provision is borne out by the trends in local authority provision over time. While data presented here are based on 1981-82 financial year figures, there is evidence to suggest that the differences between local authorities in their provision is becoming more marked as restrictions in government spending continue. Keeble (1985) has analysed the change in net expenditure and in overall levels of provision of aids and adaptations, provision of telephones, and home helps between 1981-82, and 1982-83 for Shire Counties, Metropolitan Boroughs, and London Boroughs. He notes that :

> "...while there may have been increases in aggregate levels of spending and provision for most services, there has been an increase in the variations of spending and provision between the three types of authority."
>
> Keeble (1985,pp 157).

For example the spending on aids and adaptations rose between the two years under study in net expenditure per 1000 population by 10.3% in Shire Counties, compared with a rise of 32.6% for Metropolitan Boroughs. This was from an original position where net expenditure in the Shire Counties was far below that of London or the Metroplitan Boroughs. The Counties needed to make a much greater percentage increase over the other authorities to bring their services into an equitable position with them.

The use of comparative rates per 1000 population in this critical way has itself been criticised as being over simplistic and misleading (Rodway,1979). He has suggested that much local authority investment in the field of disability may be in services not coming under the heading of aids, adaptations, and communication equipment. Much emphasis has been placed on

cross-subsidising voluntary agencies to carry out specialist work in the field of disability, rather than direct provision by social services. However, the general points made on the way local authorities can manipulate the vagueries of the CSDP Act does gain support from a definitive study of the provision of aids and adaptations in Greater London (Keeble,1979). In her conclusion, Keeble highlighted different interpretations of eligibility used by a number of local authorities. She found that in some areas these made it difficult for those with less severe or fluctuating disabilities to obtain help. Referring to the definition of eligibility of "substantial" and "permanent handicap" contained in the 1948 National Assistance Act (and still in force in the 1970 CSDP Act), Keeble notes that:

"this unrepealed Act continues to provide grounds in some local authorities for exclusion of whole categories of disabled people from services that would benefit them. People with physical impairments which are fluctuating or degenerative in character, such as arthritis, may not qualify for the aids and adaptations they need or may not get them soon enough".

Keeble(1979,pp285)

The implication of all of these facts is that variation in service provision can represent real spatial variation in equality of opportunity, and therefore in levels of handicap experienced by disabled people. Keeble's research suggests that descrimination against disabled people is a basic cause of local authority provision not reflecting the demand for services generated by disabled populations within their areas. What is not clear is how that descrimination might be structured within the local authority area itself, and if this provides the basis for a geography of handicap at the intra-local authority scale. Given the restriction in resources faced by local authorities it may be argued that it is at this scale that real differences between the quality of life among disabled people may be most effectively tackled.

Special Housing

The provision of aids and adaptations to disabled people living in their own homes has remained the main source of environmental improvement for disabled people since 1970. Purpose built accomodation and housing built to more flexible standards have, however, played an increasingly important role since the mid-1970's. Section 3 of the

CSDP Act made it the responsibility of every housing athority to have regard to the special needs of disabled people when providing new accomodation in their district. The Sharp Report(DHSS,1974) in its deliberations on mobility for physically disabled people, recommended that district authorities should contribute to their mobility by making ordinary homes more convenient for their purposes. This concept was encapsulated in a Department of the Environment Circular (DOE,1974a) which required local authority housing departments to provide special "wheelchair" housing units, and a proportion of standard housing built to "mobility" specifications. Up until this time much of the provision for the disabled took the form of reserved ground floor flats in council estates. The new wheelchair units were to be designed with the wheelchair bound in mind, while mobility housing would be of normal cost and size but have level access and a layout that enabled totally ground floor functioning. A Department of the Environment design guideline document adapted figures from the Amelia Harris Survey to estimate that 15% of the impaired in Great Britain would wish to move to housing of mobility standard, while a further 2% would require wheelchair housing (DOE,1974b). If these figures are applied to regional estimates of the number of impaired derived from the Harris Survey an estimate may be made of regional need for mobility and wheelchair housing (Table 3.3).

It has been pointed out that very little special housing facilities existed before 1970 and that the majority that now exist have been built in the 1970's (Armitage,1981). Regional construction figures for wheelchair and mobility housing for the period August 1970 and December 1982 may then be fairly compared with estimates of need derived from Harris's 1969 figures. An indication of intra-regional variation of provision is given by the range of constituent district housing authority totals in Table 3.3. There is a great deal of under provision generally, with th figure of dwellings built in the whole of England representing only 6.8% of the estimated need.

Figures range from 10.9% of need provided in the East Midlands to 3.5% in Wales, and 5.1% of need provided in the North West. It is realistic to expect housing authorities to take several decades to make a significant impact on levels of need and the general level of provision would not in themselves be cause for total dispondency. Even though, when introduced, mobility housing attracted a central government subsidy of only £50 per unit, significant progress has been made through their construction since 1974.This form of housing is at present used as family housing, having householders in their 50's generally (Topliss,1983). The concept is one that will enable people to remain in their own home as their functional ability decreases. Legislation passed in 1980 to enable council tenants to buy their own home exempted wheelchair and special disabled housing from purchase. Mobility housing was not exempted and the trend if maintained will be for these to be sold off as any other council housing stock. Public expenditure

Table 3.3 : Housebuilding- dwellings for the Chronically Sick and Disabled for England and Wales, with estimates of need for special housing

Region	1 Total Impaired (000's)	2 Estimated need for Special Housing	3 Total built 1970-1982	Built as % of need	Range of provision within region
Northern	199	34000	2186	6.4	123 - 1081
Yorkshire & Humberside	312	53000	3241	6.1	260 - 1476
North Western	418	71000	3595	5.1	354 - 2042
East Midland	172	29000	3170	10.9	135 - 1520
West Midland	271	46000	4469	9.7	365 - 2367
East Anglia	94	16000	1058	6.6	265 - 519
South Eastern	453	77000	5976	7.7	134 - 1123
Greater London	443	75000	4275	5.7	5 - 708
South Western	258	44000	2358	5.4	114 - 751
England	2620	445000	30328	6.8	5 - 2367
Wales	176	30000	1062	3.5	9 - 416

(1) Harris(1971), Table 3, pp5

(2) 17% of Impaired population, DOE(1974b)

(3) Department of Environment (1983)

constraints has at the same time lead to a marked reduction in public house building, especially where special units are concerned due to their higher unit costs. The trend is therefore towards a net reduction in the general stock of housing suitable for the disabled rather than for any improvement in the fore-seeable future.

This being the case there is cause for concern over the differences in regional provision seen over the last 13 years. A number of authors have pointed to the importance of suitable housing in maintaining an independent and relatively unhandicapped life (Brett,1981; Shearer,1981b; Bristow,1981). Regional differences may therefore be seen as reflections of inequality of opportunity to live an autonomous life and, as a result, as representing potential variations in levels of hadicap among the disabled.

Employment

Very little accurate information is available on spatial variation of employment opportunity or unemployment among the disabled. It is generally accepted that unemployment levels among the disabled are higher than for the population generally. An estimate of 1.5 million disabled people of working age without employment has been made, although this makes no distinction between those who are actively available for work and those who are not (Townsend,1979,pp1055). This represents 50.3% of the estimated number who are appreciably or severely incapacitated in the 16 to 64 age group. More detailed estimates are available from Part II of the Harris Survey, which gives an estimated number of people actually available for work of 697000 (54%) of the total disabled population of 1.29 million of age 16 to 64 (Buckle,1971;pp16-17). Of this disabled labour force 5% were unemployed, at a time when unemployment in the general workforce was running at 2% (Employment Gazette,1969). Table 3.4 shows the regional variation in unemployment rates among the disabled at the time of the Harris Survey, and demonstrates that considerable variation existed. Rates vary from 10% in the Northern region to 2% in the South East (excluding Greater London).

The Department of Employment has provided help for disabled people wishing to work since the 1944 Disabled Persons (Employment) Act. Major provisions of this Second World War Act were the establishment of Disablement Resettlement Officers to help place disabled people in employment, and the establishment of Industrial Resettlement Units for rehabilitaion and retraining. In addition there was provision for a Disabled Persons Register to supplement the "Quota Scheme" which sought to designate 3% of all jobs in firms employing 20 or more workers for disabled people. The Quota Scheme has never fulfilled its initial promise (MSC,1981; Jordon,1980). The number of registered disabled people have fallen to a point where if all were employed a full 3% Quota across

Table 3.4 : Regional levels of unemployment among the disabled (1968-69)

Region	% Unemployed*
Northern	10
Yorkshire & Humberside	5
North Western	4
East Midlands	3
West Midlands	6
East Anglia	3
South Eastern	2
Greater London	4
South Western	4
England	5
Wales	5
Scotland	8

* Those disabled who could work if a job was available

Source : Buckle (1971), Table 12, pp18

Table 3.5 : Selected statistics for numbers of registered disabled employed by public sector organisations - 1982

Authority Type	Number Authorities	Mean % Employed	Minimum % Employed	Maximum % Employed	Stand. Dev.
County Councils	53	0.9	0.2	2.5	0.47
District Councils	369	1.9	0.0	6.5	0.98
G.L.C Area Councils	34	1.2	0.5	4.3	0.71
Scottish Regional Councils	9	0.6	0.3	1.0	0.24
Scottish District Councils	53	2.0	0.0	7.3	1.21
Area Health Authorities*	98	0.7	0.2	1.4	0.25

*Since Disbanded.

Source : Department of Employment (1982)

the country could not be achieved (Department of Employment,1982). Only 1.4% of jobs in firms of the appropriate size are held by registered disabled people, and two thirds of firms with an obligation do not comply with the Quota. The MSC have pointed out that there are a number of disabled workers employed who are not registered and that this does lead to a distortion in the figures. There is, however, no adequate estimates of the number of employees of this type.

Many thousands of registered disabled people do find employment opportunities in the public sector through the quota scheme. The percentage of jobs held by disabled people does vary from authority to authority and between differing sorts of local authority. This then provides some insight into the spatial variation in compliance to the Quota across the country, in what may be considered to be a sector sympathetic to the employment needs of the disabled. Table 3.5 illustrates these variations and shows that the maximum percentage of employees being registered as disabled is 7.3%, twice the official quota, in a Scottish District Council. The range is wide however, the lowest level of compliance being 0.0%, occuring among both Scottish District Councils, and English and Welsh District Councils. The most consistently good performers are the English and Welsh District Councils who have a mean rate of employment of 1.9%, the second highest of all authorities, but with a distribution more tightly distributed around the mean. These figures again suggests that differences in employment opportunity vary spatially, in the public sector at least.

II FACTORS DETERMINING SPATIAL VARIATION IN HANDICAP

CHAPTER 4

THE SPATIAL DETERMINANTS OF VARIATION IN DISABILITY AND HANDICAP

4.1 Factors Potentially Influencing Patterns of Disability and Handicap

The Harris Survey of the impaired and handicapped, and the Knight and Warren study of local authority surveys of the disabled both revealed interesting prevalence patterns, but their methodologies did not allow for detailed examination of the reasons for the occurrence of such patterns (Harris,1971; Knight & Warren,1978). In referring to the observed regional patterns of prevalence, Harris suggested that the predominant position of the South West region is due to the relationship between old age and disability, and the high proportion of elderly people living in that area. She also suggested that in Yorkshire and Humberside, and Wales, where high prevalences of disability among men do not relate to age, a relationship may exist with high concentrations of heavy industrial occupations leading to higher rates of disability through industrial accidents and illness. (Harris,1971;pp20).

In discussing spatial variations in prevalence of disability and handicap revealed by local authority CSDP surveys, Knight and Warren point out that:

> "Factors that must be taken into account, in addition to demographic variations, are social and economic factors that determine the kind and degree of handicap; such as atmospheric conditions, differences in occupation, and variations in housing as, for example, in tenements with stairs or in retirement bungalows."
>
> Knight and Warren (1978,pp46)

Included within the suggestions made in these two major studies are a number of factors that can influence prevalence of disability. While each may ultimately effect an individual, each factor operates at different levels of abstraction from the individual. Factors can be classified into three types. Firstly, there are the characteristics of individuals; their age, sex, ethnic status, or occupational status. Secondly, there are the characteristics of the physical environment of the individual. This can be the home, the neighbourhood (with it's air and other physical factors) or the work environment. Thirdly, there is the more complex influence of the social environment, and it's relationship to personal characteristics and environmental factors. The social environment can control which personal characteristics can lead to higher probability of suffering disability. It can influence which residential and work environments are more hazardous and disabling.

Ultimately the social environment can control the location of people after they become disabled, and the level of hndicap they experience consequent to disablity. These factors can be looked at in the way that they impact on the three dimensions that characterise an individual's experience of long-term ill-health; the level of diseases and impairments, the level of disability, and the level of handicap.

In the present research context, to reach a comprehensive understanding of the geography of handicap across any area, all of these concepts of where "the problem" lies are of relevance. This is because handicap is a multi-level concept, and the causitive factors mentioned may individually, or in combination, have an influence on each of the dimensions of handicap. It will be remembered that in Chapter 1 it was suggested that, while the medical model of the causes of disease was relevent, a number of subsequent phases could be identified between disease and handicap. . Firstly disease could cause impairments that effected the body or mind's ability to carry out functional activities, such as gripping, making sounds, or to sit up properly. These could be referred to as impairments.

These impairments can have wider implications for an individual, making him or her unable to carry out normal daily activities that were normal for their peers, and which were part and parcel of being an independent human being. These might include an inability to wash or groom one's self, prepare food, move around one's house or neighbourhood. These we have termed disabilities. The factors which influence the resources available to an impaired individual, both from personal sources, and from public sources, to reduce the impact of impairment on daily life are again a major focus for study in understanding patterns of disability and handicap. These would include the availability of medical and rehabilitation service.

Finally an even wider set of disadvantages might result from such impairments, and disabilities. We all have social roles that we expect to play as we develop as children and into adulthood. These include roles of worker, husband or wife, father or mother, neighbour or friend, and many many others. These roles may be seriously effected or even curtailed by impairment or disabilities, and these role losses we have termed handicaps.

It has been suggested in Chapter 2 that handicap is a condition with two sides to it. As our roles are conditioned by the expectations of the society in which we live, it may not merely be that handicap is solely dependent on one's physical or mental difficulties. Many of these may be overcome by the intervention of a caring and tolerant society. Many difficulties are made fundamentally more destructive to a person's independence

by the expectations and actions of individuals and organisations. Patterns of handicap may well be dependent on variations in the attitudes of the populations in which disabled people live.

The extent to which handicap can follow on from impairment and disability is also in part determined by the range and quality of personal help , resources, and specialist support that a person has at his or her disposal to help overcome their role loss. The formal health and welfare services play a major role in this respect, and a focus on the accessability of the health care and welfare network to disabled people, is again of relevance in understanding observed patterns of handicap.

In searching for the most influential root causes of the patterning of disability and handicap, we need to retain an open mind and look at all factors that may act to generate impairing disease, influence levels of of subsequent disability, and have an impact on handicap experienced. This potentially involves one in drawing information from a number of sources of research. Giggs (1979) has suggested that the relevant research into geographical aspects of ill-health have been characterised by the following approaches:

> "1. The spatial patterning of ill-health and mortality.
>
> 2. The spatial patterning of the physical and human environmental characteristics that adversely affect man's state of health.
>
> 3. The spatial patterning and use of the main elements of the health care *delivery systems* developed to combat diseases and the environmental hazards that affect man's health".
>
> Giggs (1979,pp 85)

It is clear from this set of definitions that medical geography can provide an insight into more than one factor involved in the generation of impairing disease and subsequent disability. It is also clear it does not cover all the potential factors, and that other disciplines may also have some explanations to offer. This Chapter continues, therefore, with an examination of research from the medical geography traditions, particularily in relation to the role environment plays in the creation of spatial patterns of disabling disease.

4.2 The Environmental Determinants of Variation in Disability

As we have seen in Chapter 3, there are a very large number of diseases and disorders which may determine who becomes disabled or handicapped in an area. A

comprehensive review of individual relationships between specific disabling disease and environmental conditions is not thought to be productive at this stage. Instead the chapter concentrates on determining whether environment:disease relationships may have a place in an explanation of large scale patterns of disability and handicap. In respect of the links between environment and disabling disease, environment may be conveniently arranged into three categories, natural environments, man-made environments, and social environments.

The Natural Environment

Pyle (1976) has noted that disease/ environment relationships had been described in the 1930's and the 1940's, but that a process orientated approach to disease ecology had not emerged until the work of May in the 1950's. May's approach centred on the relationship between "pathogens", representing the causes of diseases, and "geogens", representing geographical environmental influences. May described five pathogens; causitive agents (viruses etc.), vectors which spread agents (mosquitoes etc.), intermediate hosts which are essential to the life cycle of the agent, reservoirs which carry the agent in nature until passed on, and man himself. Geogens were seen as being of three types; inorganic environmental influences such as climate, organic environmental influences such as soil type, and socio-cultural environmental influences, which include all aspects of human culture and its distribution that may effect the onset of disease. Phillips (1982) has classified these approaches as of the disease ecology tradition.

McGlashan (1966) has suggested that some elements of causation could be determined through spatial analysis, and Pyle (1976) noted the emergence of an associative form of ecological study during the 1960's. The approach is to be found in more recent work however, such as Roundy (1976) in his work on the exposure of Ethiopians to malaria and other diseases in the course of any migration into higher altitude areas characterised by adverse natural environments. Dutta and Dutt (1978) and Learmonth (1978) have also dealt with the disease ecology of malaria, while Schuman (1972) has dealt with the effect of the heat island in Central New York on mortality rates. These all share some elements of the disease ecology approach in their methodologies.

Many of the studies in the ecological tradition have concentrated on infective processes and, while influencial in creating long-term disability, these processes remain of more relevance in developing countries. There are however, a small number of studies which do indicate that the natural physical environment can still be an influence on disabling disease in western industrialised countries. Wellmer (1981) has analysed the relationship between tic-borne encephalitis and certain

features of the natural environment in central Europe. One of a number of strains of Encephalitis, Central European Encephalitis can lead to paralysis, heart disease or, in a small number of cases, death. The virus is delivered by the Ixodes Ricinus tic in any of it's three forms from larvae to adult tic. Incidence of the Encephalitis was found to be related to the distribution of the favoured habitat of the tic, in part of Czechoslovakia, Austria, and Germany. These consist of temperatures between 7 and 27 degrees centigrade and over 80% humidity, low lying, dense and diversified vegetation, with an abundance of intermediate animal hosts. While incidence is only of the order of 600-900 cases per year, the localised effects of a disease agent being located in a restricted range of environments, can lead to high localised rates of encephalitis related disability.

Even more relevant in this context is a study by Giles (1980), who looked at the relationship between asthma in childhood, and certain environmental factors. Giles found that, in New Zealand, incidence of asthma could be related to temperature fluctuation, altitude, and the effects of vehicular, domestic, and industrial pollution for those living in urban areas. Here asthma was said to effect 16% of 7 year old children in the state, representing a significant influence on long-term health.

Howe (1960) has also identified a number of environmental factors that may be linked to the incidence of a number of cancers. Once again, while the research is based on data on mortality due to the diseases, cancer can be disabling in a number of its stages. Studies relating to the environmental links of some cancers are therefore significant to a wider discussion of the environmental roots of disability. In his study of Welsh mortality rates, Howe was able to map Standardised Mortality Ratios for cancer of the lungs and bronchus, rectum, larynx, oesophagus, and large intestines, for administrative areas in Wales. The environmental factors investigated included pollution, in the form of smoke concentration, water supply and soil types, with the addition of genetic factors through the spatial patterns of blood types. An association was suggested between atmospheric pollution and lung-bronchus cancer. An association was also suggested between stomach cancer and the acidic, untreated water supplies used commonly in the Welsh countryside at that time.

Howe was unable to make substantive comments on the relationships postulated as no objective tests of association were adopted. A study by Giggs et al (1980) provides a link between studies of this type, and those which Phillips (1981) has termed "Ecological Associative Studies". Phillips has identified as key features of the ecological associative approach the use of statistics, both to clarify spatial patterns of disease, and in

relating these patterns to social or environmental characteristics. Two types of study may be identified, the first having the ecology of disease as it's primary focus, while the second , social area analysis, concentrates on the economic and social correlates of ill-health. The two types of approach are found to overlap to some extent in particular studies.

Giggs et al (1980) carried out a study of acute pancreatitis in Nottingham, and employed probability mapping and a Moran test of autocorrelation to determine the objective significance of the observed pattern of the disorder. The study went on to investigate the possibility of a number of processes operating to produce the observed patterns. These included the use of space-time contingency tables to test for the involvement of infective processes. Pearson correlation techniques were also used to test for a relationship with age, and also to test for any relationship with social class. In this case social class was seen as a surrogate measure for dietary differences. While these particular measures revealed little of a significant nature, a number of water hardness indicators were found to be related to the pattern of the disorder.

In attempting to develop a set of explanatory factors for the spatial distribution of disability, and ultimately of handicap in the United Kingdom, studies in the disease ecology traditions have not dealt extensively with disorders relevant to disability. Studies of infectious diseases predominate, particularily of cholera and malaria, and while these remain an important cause of mortality in the third world, there importance in explaining prevalences of disability in the west in late twentieth century is limited. As Giggs(1979) has pointed out :

> "In western countries virtually all the severely disabling and killing communicable diseases which were endemic during pre-industrial and early industrial times have largely been eradicated. Today a variety of non-communicable and 'social' ills constitute the most important human health hazards"...."heart disease, cancer, and mental disorders are now the leading causes of disability and death in most western countries..."
>
> Giggs (1979,pp 84)

However, while only dealing with relatively small numbers of sufferers in relation to the percentage of people suffering from disabilities, the studies cited here have demonstrated that natural environmental factors cannot be ruled out in any investigation of large scale patterns of ill-health in the western context.

Studies carried out in the Ecological Associative traditions have often attempted to establish links

between ill-health and aspects of the man-made environment. It would seem that relationships between man and his own environment represent more fertile ground in unravelling the processes behind patterns of disability.

The Man-Made Environment

Gardner (1982) has provided a study in the ecological associative tradition which develops the relationship between the work place environment and ill-health. Gardner investigated the relationship between mortality due to pleural mesothelioma, cancer of the middle ear and associated cavities, and bladder cancer, and local environmental influences. The study found high rates of pleural mesothelioma in East London, Merseyside, Tyneside, Southampton, Barrow and Plymouth. The high levels of the disease were suggested to be associated with dockyard industries, and especially with the past use of asbestos in manufacture. Strong links were also postulated between middle ear and sinus cancer, and areas associated with the furniture industry and the manufacture of shoes and boots. The mechanism is thought to be the materials used in the manufacturing process. Finally bladder cancer was associated with South Lancashire, West Yorkshire and parts of London through the use of dyestuffs and rubber in manufacturing. The main findings were that hazardous work environments rather than hazardous residential environments were the places in which disease is contracted. Rather than there being natural environmental factors effecting residential areas, the link exists between particular members of well defined residential communities who work in hazardous industries.

A direct link between residential setting and disabling disease was put forward by Dever (1972). He noted that multiple cases of leukaemia had been found in one house among non-related residents who occupied the house at different periods in time. Dever went on to test the hypothesis that housing units in which leukaemia occured were in some way different from houses of the non-disease population. He adopted four scales of analysis ranging from the census tract to the individual housing unit level of the families suffering from leukaemia. The method of analysis concentrated on the association of the numbers of people suffering the disease with household related variables, using both simple correlation and regression, and partial correlation and multiple regression techniques. The variables used included measures of housing quality, housing value, rooms available and occupational densities.

Dever expected to see relationships between the disease and explanatory variables to vary with the spatial scale adopted. In practice no substantive relationships were found to exist at the census tract or at the scale of the residential block. When leukemia homes were aggregated to

14 tax districts each containing some 5 census tracts more interesting results were obtained. In 7 of the 14 areas a multiple correlation coefficient produced a significant relationship, these areas forming a core of high risk zones at the centre of the study area, with a crescent of low risk areas around its periphery. Individual associations between the disease and a number of variables led Dever to suggest that potentially crowded conditions were related to the incidence of the disease, and that an infective viral aetiology was to be favoured as the causal mechanism.

Finally Dever looked at the houshold scale, introducing the dwelling type, construction type, and the presence or absence of a fire-place or laundry facilities as additional variables to the analysis. A Smirnov test suggested the fact that leukaemia suffers were more commonly found in apartments than might normally be expected, but construction type made no difference to the incidence rate. The presence of a fire-place was found to be significant, and the smaller average number of rooms available to leukaemia families helped confirmed crowding as a significant factor.

Housing characteristics were put forward as one of a number of explanatory variables by Girt (1972) who carried out a study in Leeds in which he looked at patterns of simple chronic bronchitis. The basic hypothesis tested was that the risk of contracting the disease would increase with increasing exposure to an environmental hazard. Girt combined aggregate and individual perspectives in his study, by first sampling 30 areas from a city conceptually divided into a zone and sector model , and then interviewing a random sample of women living within these areas. Girt found some evidence , although not conclusive, of concentric and sectorial patterning of disease, reflecting industrial land use, housing type, and of social class patterning. Girt continued by including a number of variables in the analysis relating to the present and past exposure of those in the sample to working conditions potentially detrimental to their health. These were residential density, damp housing conditions, and polluted working conditions. A final simulation model provided a good fit to the observed pattern of chronic bronchitis, with damp housing conditions, overcrowding, and a history of smoking as significant explanatory variables. Social class and smoking behaviour were, however, significantly correlated, which makes the individual effect of social class more difficult to identify.

Girt's work shows that the quality of housing, and the density to which we inhabit them may contribute to our ill-health. This is especially important where chest diseases are involved, and this class of disorder is a major cause of disability in the population as Harris (1971,Table x) has shown. Girt has also touched upon the issue of the work place as a potential source of

disabling disease. Gardener et al (1982) developed this theme in their study of various forms of cancer. Here the materials handled were seen as the primary contributing factors to the high levels of particular cancers experienced in the areas studied. The spatial manifestation of such causitive mechanisms was clearly seen to operate through historical links between people living in particular areas and work in the hazardous industries in question. Although the disorders in question caused death they undoubtedly lead to episodes of chronic illness and disability for some sufferers. Other manufacturing processes that effect health may lead more commonly to disability rather than mortality, as in the case of the mining industry and chronic chest disorders. It is clear, therefore, that working practices adopted in industry, and their relationship to the residential locations of their work force, are potentially influencial in any explanation of patterns of disability.

Social Environment

We have already begun to see in preceeding studies the fact that environment and the characteristics of the people living in that environment are related, and may reinforce the trend towards high localised maxima for ill-health indices. The investigation of aggregate relationships between population characteristics and ill-health has attracted the attention of a number of geographers over the years. Phillips (1981) has been able to identify a distinct group developing out of an ecological associative tradition and has called these "social area studies." The emphasis here is not on the urban ecology of the diseases in question, but on the fact that areas with particular forms of social milieux exhibit disproportionately high levels of undesirable characteristics, such as crime and ill-health.

One such example come from Pyle (1971), who set out to forecast intra-urban prevalences of a number of disorders using the socio-economic characteristics of those areas in a multiple regression model. This was ultimately used to forecast the need for medical services in the city of Chicago at 1980. Total rates of mortality due to cancer, heart disease and stroke were found to be significantly positively related to age and residential density, and negatively related to income. Additionally stroke and heart disease were positively related to the proportion of black people in the area's population.

A number of studies have looked at the relationship between social structure and undesirable phenomenon, research often being carried out through the use of multi-variate analyses, such as Principal Components Analysis and Factor Analysis (Johnston, 1978; Herbert & Johnston, 1976; Herbert, 1968). Following on from the less technically sophisticated work on modelling future

medical needs, Pyle and Rees (1971) carried out a study of eighteen disease variables across 76 areas within Chicago. In a Factor Analysis a main factor accounting for 39.8% of the variance represented zones of poverty, and this was associated with high levels of premature births, measles, tuberculosis, infant mortality, siphilis and Gonorrhea. A second factor accounting for 22.7% of the variance represented a pattern influenced by residential density, and this was associated with the childhood diseases of mumps, whooping cough and chicken pox. While not well defined, a fourth factor was identified accounting for 10.4% of the variance, and represented an association between areas located near to open water, and higher levels between infectious hepatitis. A strong aetiological link between water and infectious hepatitis was known to exist. The relationship between high density living and the higher than normal observed rates of childhood disorders can be understood through the infectious nature of such diseases. The association between poverty and the multiple problems loading on to the most important factor are less easily explained in causitive terms.

In the field of psychiatric illness Giggs (1973) carried out a study of schizophrenia in Nottingham. Using registers giving the address of sufferers at time of admission, Giggs was able to analyse the spatial distribution of patients at two levels. At the first level one kilometer rings were drawn emanating from the Central Business District in Nottingham and the level of schitzophrenia mapped into these zones. The study found that incidence rates were higher in central areas than in more peripheral areas. He refined this approach by calculating "Attack Ratios" standardising for the different risks of onset found naturally among men and women. When mapped these ratios confirmed a concentration of schizophrenia within central Nottingham.

At the second level Giggs went on to look at the correlation between different types of schizophrenia and 29 socio-environmental variables representing the population structure, the household structure, the pattern of household amenity, and the socio-economic structure of Nottingham. Using Factor Analysis Giggs identifies two main dimensions representing associations between areas having unfavourable social and living conditions and the incidence of schizophrenia.

Once again the areas most associated with these two dimensions were those located the inner parts of the city, and characterised by mobile single people, shared dwellings and rented accomodation, low social status and high rates of unemployment. Giggs went on to suggest that particular types of milieux in cities may make the development of schizophrenia more likely to develop.

The relationship between schizophrenia and areas with highly mobile populations has been supported by other

studies along with a general tendency for an association with inner city locations (Faris and Dunham, 1939 ; Castle and Gittus,1957; Timms,1965). There is evidence that the association may be based not merely on the physical environment of these areas, but on the social structure of the communities within them (Eyles & Woods,1983;pp91). Both Castle and Gittus (1957) and Timms (1965) found some association between mental disorders and peripheral council housing estates, indicating that the shift in pattern was related more to a move of inner city dwellers to the periphery.

Many other social area studies have taken place with the whole issue of social organisation and well-being as their central focus. Ill-health, disabling disease, and mental illness form only one dimension of these studies. We have already seen ill-health is associated at an aggregate level with unfavourable living conditions and unemployment. Smith (1973) in a study of Gainesville and Tampa, Florida found that high levels of bad housing, low income, crime were all associated with ill-health, and all were concentrated in black residential areas of Gainesville.

In a British example, Thomas and Phillips (1978) investigated the associations between numbers of children admitted to hospital as emergency cases in the West Glamorgan Area Health Authority, with the socio-economic characteristics of the areas they came from. Employing a Principal Components Analysis of 26 census variables and incidence rates for presenting illness among children, Thomas and Phillips identified significant associations between all eight measure of illness and six census variables. These key variables were local authority housing tenure, a young age structure, low levels of car ownership, substandard dwellings, low social status, and young economically active women. The authors suggested that the association between child illness and council housing was due to the life styles adopted in these areas. The association with poor quality housing was due directly to the low standard of environment and the hazards they presented to children, with detrimental cultural factors related to low social status being a secondary influence.

In conclusion it has been suggested that environment in its widest sense can influence prevalence of disability. Evidence from work carried out within the discipline of medical geography have shown that, while "geogens" and infective "pathogens" have only a small influence on aggregate patterns of disability in the western world, physical environment still has to be taken into account when attempting to explain patterns of disability. It is clear, however, that local employment structure, and industrial manufacturing processes can effect local prevalences of disease, and provide a causative link to the man-made environment. Local environmental hazards, both inside and outside the work-place have, therefore, a

part to play in any general model to explain spatial patterns of ill-health and disability.

Similarily a number of undesirable urban human residential environments have been associated with high levels of disease and mortality, mainly involving high densities of occupation, and damp and poor quality housing. Measures of ill-health can also be closely related to the social composition of the population living in these areas. Low social class, financial deprivation, and ethnic minority residents are themselves associated with poor residential environments and high prevalences of disease. The prevalence of mental illness in addition to physical disease, can also be associated with some of these elements of social structure. Eyles and Woods (1983) observe that, while many geographical studies have uncovered relationships between many forms of ill-health and unfavourable socio-economic environments , the causal mechanisms wait to be uncovered elsewhere. They are to be found instead within :

> "pathogens, the work environment of a group, the poverty, age and culture of a people or the personality of an individual. Even behind the distribution of and diffusion of infectious diseases, there lurks the poverty of the people effected. Environment certainly acts as a stimulant to health or disease but explanation lies in economy, society and psychology."
>
> Eyles and Woods (1983,p 100)

To explain patterns one must have an appreciation of the underlaying problems associated with individuals in social and cultural groups. It is to these issues that the next chapter addresses itself.

CHAPTER 5

INDIVIDUAL CHARACTERISTICS AND VARIATION IN DISABILITY

5.1 The Elderly and Their Influence on Spatial Patterns of Disability

Having looked at the influence of the environment on prevalence of disability , we now turn to the role played by the characteristics of those who live in areas. It has been suggested in Chapter 4 that the relative age of an areas population will be of importance, as around 60% of the disabled population is of age 65 or above. The General Household Survey for 1981 shows clearly the extent of long-term and crippling illness among the elderly. For those people aged 65 and over, 38% of men and 47% of women suffered from long standing chronic sickness of a limiting nature (OPCS,1981;Table 6.7). This compares with 16% and 19% respectively for the population as a whole. The larger percentage of women than men suffering is due to there being many more very elderly women in the population, with a subsequent increased prevalence of ill health. This fact is then reflected in the average figure for long standing chronic sickness among the whole group of women aged over 64. Harris (1971) pointed out that while the elderly represented only some 16.3% of the total population at the time of her survey, they constituted 64.7% of those identified as 'handicapped' in her study . When looking at regional trends, Harris's study identified the South Western region as having the largest prevalence figure in the country. She identified the high proportion of elderly people, especially women, in the south west as a direct causal influence on the high prevalence of impairment and disability in the area.

The distribution of the elderly across space is therefore of profound importance if one is to understand the spatial distribution of disability. As the role of the elderly has been identified as a key feature in the high prevalences experienced in the south west, it is useful to start with the the south west to draw out some of the systematic elements behind spatial concentration of elderly people.

Large numbers of elderly people can be found in any particular area because the whole population of that area ages "in situ", with little out migration of the elderly taking place, or through large numbers of elderly people migrating into the area. Additionally the elderly population can form a proportionately large section of the community if the young people of the area migrate out in large numbers . For those elderly people moving into an area this can be due to a positive choice on their part to do so, or it can be because they are constrained to that locational move because there are few other alternatives given their circumstances. In the South West region the moves into the region have been occurring

primarily through a positive choice on the part of a relatively affluent group of elderly people (South West Economic Planning Council,1975). The retirement population of the South West rose from 290,000 in 1921 to 740,000 in 1971. There have been important differences in the way the population has developed over the period, increases occurring up to 1951 reflecting processes of natural change in the indigenous population. After 1951 in-migration increased to take over as the major growth element amongst the elderly population, leading to an influx of an estimated 56,000 elderly people over the twenty years to 1971.

These increases in the elderly population have not been equally distributed across the region, with Devon and Cornwall more than doubling their additional retired population, while other parts of the region rose by only a quarter through in-migration. Table 5.1 shows the distribution the additional retired population based on 1971 Census statistics. The "additional retired population" has been calculated as the number of elderly people in excess of that expected if a national percentage elderly figure is applied to the total population of the area in question. It can be seen from the table that the Exeter/Torbay sub-region accommodates 40% of the regional total of additional elderly, and that the South East sub-region accommodates a further 20%.

The reason for moving to the South West are the same as those which attract holiday makers to the region, namely ameneity and favourable environment. This can be confirmed by the existence of concentrations of elderly people in other regions such as Worthing in the South East, in parts of Wales, and in the Fylde in the North West. These concentrations are however found only locally in these regions , in coastal strips or in spa towns. The penninsular form of the South Western region means that the favourable environments and coastal locations are spread throughout the region, with the result being a more widely distributed in-migrant elderly population (South West Economic Planning Council,1975; p 1).

The role of choice in this in-migration is confirmed by dominant social class characteristics of the in-migrant elderly to the South West. When compared to the class composition of the national male elderly population in 1971, the in-migrant group is estimated to have about 40% from professional, managerial and technical groups, double the proportion among the elderly nationally. Manual groups account for only only one-third of the retired elderly in the South West region, compared with half for the national retired population in 1971 (South West Economic Planning Council,1975;p 5). As one might expect from this class bias, those migrating to the region are mainly home owners, which gives them as a group much more potential resources and therefore an increased ability to relocate.

The income levels among the in-migrant elderly are higher than both the income levels of the indiginous elderly,

Table 5.1 : Geographical distribution of the additional retired population; South West Region, 1971

Sub-Region	Additional Retireds No. ('000s)	As % of SW Total Population
North Gloucestershire	1	1
Bristol- Severnside	15	11
North Wiltshire	-7	-5
Wellington-Westbury	3	2
South East Area (1)	25	18
Exeter- Torbay	51	37
Plymouth Area	16	12
West Cornwall	17	12
Bodmin- Exmoor	17	12
South West Region (1)	138	100

(1) Excludes Bournemouth and Christchurch Districts due to calculations pre-1971 local government reorganisation

Source : South West Economic Planning Council (1975, pp 5)

and average national income levels for the elderly. The South West Economic Planning Council(SWEPC), quoting Social Security statistics were able to estimate that the in-migrant elderly population had a household income of between £3 and £8 per week more than the national average for the elderly in 1975 (SWEPC,1975;pp10). They suggest that this income was more likely to come from occupational pensions and investment income than from statutory sources available to the average pensioner. The Inland Revenue Personal Income Survey of 1969-1970 showed that in-migrant elderly in the South West had on average occupational and state pension incomes of £720 per year, compared with an average of £515 nationally, and an average annual investment income of £400 per household compared to £75 among other elderly in the region.

Finally the most significant flows in terms of numbers of elderly coming into the region were found to come from the West Midlands and Greater London areas. Together with the financial information presented, this suggests in-migrants to be a relatively affluent, urban group of elderly people from higher social class backgrounds making positive choices to sell their homes and relocate in traditional holiday and leisure areas to enjoy their retirement. As they age they acquire disabilities which add to the prevalence of disability among the indigenous elderly population to produce high levels of aggregate prevalence for the regions population as a whole.

5.2 Urban Patterns of Disability

Are such concentrations of elderly people to be found at lower spatial scales such as the intra-urban scale? Undoubtedly they are and this has as important an influence on intra-urban patterns of impairment and disability as it can have at the regional level. The elderly have not however, been found to conform to any simple spatial model of locational behaviour. Warnes (1981) in his review of geographical contributions to Gerontology points to a number of studies of urban patterns amongst the elderly which have identified localised concentrations. During the 1970's a number of studies identified associations between depressed inner city locations and high proportions of elderly people, this feature being proposed as a recognisable dimension of inner city polarisation. The relationship between the ageing of particular urban neighbourhoods and their constituent housing stock, and the active phases of urban growth, have been seen to contribute to a more spatially identifiable elderly population. It has been suggested that:

> "as (urban) growth occurs, the new growth made up predominantly of young population takes place on the periphery; as growth speads up this new growth is more uniformly young and the contrast between the new ring and the old becomes more vividly measurable."
>
> Cowgill (1978,pp 452)

Concentric patterns among the elderly have been observed by American and Australian researchers (Coulson,1968; Scott,1971). Massey (1980) in a study of the Needy Elderly and Disabled Population (NEAD) as defined in the American 1970 Census of Population, showed a non-random pattern of residential segregation between this group and the economically active labour force. The NEAD population were found to reside predominantly in the inner cities and were spatially associated with the presence of older, low rent, high density housing in North New Jersey.

Older and more complex urban settings are found to exhibit less well organised patterns among the elderly, although localised concentrations are still to be found. Williams (1975), in a study of Greater Manchester, identified a scattered distribution for wards having over 40% of their population in "two person/one elderly person" households. Pinch (1979) in a study of the provision of personal social services for the elderly in local authority areas within Greater London, found that London Boroughs with the highest proportions of elderly people in their populations tended to be outside the inner city and tended to be Boroughs characterised by relative prosperity. In the American context Rudzitis (1979) identified high concentrations of elderly people in the Chicago Metropolitan Area as being usually associated with areas of low status. This study highlighted the fact that elderly concentrations can exist in areas of low status, but that these need not necessarily exhibit depressed or poverty characteristics. In this Chicago study, levels of unemployment in the areas in question were low, with much of the labour force of working class and "white collar" status.

A study by Herbert and Peace (1980) had more in common with the observations made by Pinch (1979) in that they described distinct clusters of elderly inhabitants living in high status parts of central and west Swansea, as well as concentrations in lower status parts of the inner city associated with terraced and council owned dwellings.

There is therefore, evidence to suggest that elderly people are to be found unequally distributed within urban areas. The patterns these concentrations take range from inner city clustering, through concentric ring patterning to dispersed groupings as in the case of Manchester. The socio-economic and environmental characteristics of individual neighbourhoods having high proportions of elderly people do vary, from high status with good levels of ameneity, to low status deprived areas containing ageing housing in high density. The range of patterning and the range of socio-economic contexts in which concentrations of the elderly are found suggests that a number of processes may be at work in creating these patterns.

Golant(1972;pp 49) has suggested that:

> "while various models of population distribution are relevant, none by itself is sufficient, least of all one describing a decreased concentration of elderly with increasing distance from the centre of the city."

What then are the various models that might help explain distributions of elderly people and therefore help to provide a theoretical basis for explaining the development of patterns of disability and handicap? Golant (1975) has proposed two broad categories to describe concentrations of elderly people; unplanned and planned (or quasi-planned) retirement concentrations. This provides a useful conceptual division for discussing the causes of spatial clustering among the elderly.

5.3 "Unplanned" Explanations for Concentrations among the Elderly

There are a number of explanations that can account for large numbers of elderly people being found in any given area, one set being based around the idea of indigenous populations ageing in situ, rather than invoking dynamic processes of in-migration. Golant (1975,pp 264) points out that where new housing projects of the 1950's and 1960's in America attracted low income populations of broadly similar age distributions, these areas are now exhibiting high levels of elderly residents, the population having remained stable and aged as a cohort in situ. This observation is supported by evidence that middle aged and older people exhibit inertia in relocating, even if their housing deteriorates, or their need for space is reduced when children leave to set up home on their own (Barnard, 1978). In Britain, Age Concern point out that:

> "Moving house is not a process that people embark on lightly, especially as they grow older. Consequently most elderly people have lived in the same house for a long time. According to a survey carried out by Age Concern in 1974, over a quarter of the elderly had lived in the same house for more than 30 years, and 5% had lived there for more than 50 years. The evidence suggests that there are substantial numbers of people living in the accomodation they moved to when they married."
>
> Age Concern (1980,p 8)

The distribution of the elderly population across the various housing tenures gives added support to the notion that ageing in situ may be a major contribution to the formation of concentrations among the elderly, especially where residents were originally of a similar age range. Table 5.2 demonstrates that 37% of those aged 60 and over in 1975 rented their accomodation from a local authority, and that 46% owned their own home. Many of those now aged over the age of 60 would have been born in the private rented sector, as in 1918 90% of all accomodation was in

Table 5.2 : Housing tenure of those aged 60 and over

Housing Tenure	Percentage	
	Whole Population	Population Aged 60 & over
Owned outright	24	42
Owned on a mortgage	30	4
Rented from a local authority	32	37
Rented privately (unfurnished)	11	16
Rented privately (furnished)	3	*

* Less than 1%

Source : Age Concern (1980; Table 3.1, pp 10)

Table 5.3 : Relationship between income and age of home among elderly owner-occupiers

Annual Income	When home built (%)				
	Pre-1900	1900-1919	1920-1945	After 1945	Total
Less than £750	29	34	37	0	100
£750 - £1000	33	21	37	9	100
£1001 - £1500	26	21	42	11	100
£1501 - £2000	16	21	49	27	100
£2001 and above	21	17	46	16	100

Source : Age Concern (1980; Table 3.3, pp 11)

this sector. As the scale of local authority and private ownership has developed in the intervening period, local authority housing played a dominant role early on in providing homes for those previously in the private rented sector. Only in the last twenty years of the period has private ownership become the dominant tenure. This has ultimately led to the very elderly being more commonly found in public sector housing.

As council homes become too large or inconvenient for increasingly elderly people, the opportunity for planned relocation within the private sector is severely limited. Only 3% of local authority housing stock is in the form of one bedroom houses or bungalows, and only 13% in one bedroom flats (Age Concern,1980;pp38).

The building of family size housing to cater for the need of ageing inhabitants (known as housing to mobility standards) has not had a major impact on the characteristics of public sector housing. Those houses that have been constructed to mobility standards are not in general designated "special housing" to which elderly people may be transfered when appropriate. While the development of sheltered housing specially designed for the needs of elderly people has continued during the last 10 years, the numbers of units involved have not in general increased the potential mobility of the elderly in the public sector significantly.

While 46% of the elderly owned their own homes outright, it has not necessarily meant that those owners are a financially well-off and mobile group. Table 5.3 demonstrates the strong relationship between elderly people with low incomes and owner occupied housing of relatively old construction. This firstly supports the general point made earlier that elderly people have a tendency to grow old with their neighbourhoods, leaving the colonisation of more recent developments to younger households. Secondly it indicates that the housing of many elderly people is in need of significant investment to maintain it's utility and resale value.

With many of these elderly owner occupiers in the lower income brackets it can be assumed that the potential for being able to realise significant capital from the sale of their old housing is limited, thereby limiting their potential for relocation in new areas with younger populations. The general relationship between the inability of the elderly, for one reason or another, to maintain the utility, and therefore the resale value of their properties, is supported by the Department of the Environment, which state that:

> "The majority of households lacking at least one basic amenity (WC inside the building, fixed bath or shower and proper hot water supply) were elderly households: 30 percent consisted of a single person aged 60 or over, and 24 percent consisted of a couple at least one of whom was aged 60 or over."

Department of the Environment(1978,pp 17)

The doubt thrown on the ability of many elderly people to financially maintain their homes or to relocate within the private owner occupied market is supported by a number of authors who note the low income status of the elderly generally (Townsend,1979; Age Concern,1979; Topliss,1983; Tinker,1981). While there are a range of incomes among the elderly, the main differences occur between single pensioner households and two person households which have one pensioner present. The average gross income for one adult pensioner was in 1977 found to be £29.73, compared with £56.20 for a two person household with one pensioner present (Age Concern,1979;p 7). While the most affluent elderly household incomes compared badly with that of a younger household, their weekly income was £111.04, more than double that of the best elderly household income, and four times larger than that of an elderly person living alone. In summary therefore, pensioner households are generally less well off than others in society and would find it difficult to relocate. Where a pensioner is living alone the income available would prove severely restrictive.

Not only are elderly people restricted in their ability to relocate within their original housing tenure, they are also severely restricted in their ability to relocate by moving between sectors. Council tenants would find it very difficult to obtain a realistic mortgage when retired, and therefore find it difficult in advanced years to move into the owner occupied sector. Equally, hard pressed local authority housing managers are not generally able to look favourably on applications for council accomodation from elderly owner occupiers unless major health issues are involved (Housing Development Directorate,1980; p 9). The tendency is for people to remain in one place for much of the later years of their lives. If private or public sector housing developments have attracted a generally homogeneous age group at their creation, the potential is created for the population of that area to move through into old age together, thereby creating a localised concentration of elderly people, and ultimately the potential for a concentration of increasingly disabled people.

If ageing in situ plays a major part in structuring the elderly spatially, then the out-migration of younger people, along with the failure of the young to migrate into areas characterised by large proportions of elderly residents, are compounding influences. Massey (1980) and Cowgill (1978) both make the point that urban development taking place away from existing residential areas can highlight the developing "segregation" of the elderly into particular areas or zones. In his study of Metropolitan Areas in the United States, Cowgill identified correlations between segregation indices for the elderly population with urban growth in the period 1960 to 1970. This led him to suggest that young people migrating to peripheral residential growth areas was

providing a demographic contrast to the older residential areas, the proportion of elderly residents in the latter having increased as a result. In seeking to explain high segregation indices for the Needy Elderly and Disabled population in North New Jersey, Massey demonstrates that 400,000 people leave every year from American central city locations to live in the suburbs. These have been, in the main, middle class employees responding to the shift in location of employment opportunities. Non-labour force groups remain behind in the older residential areas because they cannot afford suburban house prices, private transport costs, and to an extent because they are tied to centrally located support services that represent up to a half of their income in cash value (Massey,1980;p 190).

When concentrations of elderly residents have developed, they in themselves tend to generate a "negative feedback" system that reduces the likelihood of young families migrating into these areas and helping to redress the imbalance. In these communities of uniform age structure, out-migration is rare, and housing vacancies occur through death, or through enforced vacancies due to illness. There are therefore, few opportunities for younger people to buy houses in these areas. In addition the houses themselves may tend to be older and in need of finance to rehabilitate them, possibly forming a dissincentive for younger first time buyers. Finally, the ambience of an area with high concentrations of elderly people may not be conducive to the attraction of younger families.

Golant (1975, p 265) has pointed out that positive feedback can occur in the same situation, with elderly people who do have the ability to relocate being drawn to areas having high concentrations of other elderly people. This may be due to a wish to be close to people of one's peer group, or because local services have been developed to cater for the needs of the indigenous elderly, and therefore make the area more attractive for exogenous elderly people.

There are a number of strong reasons to explain why concentrations of elderly people may form in the urban landscape and, when formed, why that concentration may be maintained and intensified. There are however, circumstances under which concentrations of elderly people may be developed as a conscious act of policy, and it is to these that we now turn.

5.4 Planned or Quasi-planned Explanations for Concentrations among the the Elderly

Planned housing schemes aimed at the elderly do have potential for influencing the spatial patterns of the elderly, and therefore of the disabled. Scale is however, very important. For example a special housing project for the elderly developed within a new housing estate could have a significant effect on statistical segregation indices calculated at the intra-estate scale. When

calculated at the electoral ward, or the inner city/outer city scale, the segregation indices may be less effected by such a small project, with unplanned processes of elderly segregation becoming more important.

Golant (1975) has proposed eight dimensions for the classification of diverse forms of retirement residence which promote spatial age segregation. Using these he identified five major groupings of retirement residence, the first of which were retirement villages catering for several hundred to several thousand retired people. These are designed specifically with the elderly in mind and have facilities specifically catering for the practical, environmental and leisure needs of older people. Retirement hotels form the second grouping , which are characterised by properties that can no longer be run profitably as resort or tourist hotels. These may offer the same facilities as normal hotels, and could be found in central or inner city areas, offering special recreation programmes, diets, and in some cases nursing care.

The third type of residence identified was trailer villages or mobile home parks where elderly people in caravans or mobile homes congregate together on sites offering short or long-term location. Some people remain on the same site for five or more years and some "village" communities may offer special social or recreational activities for the elderly. The fourth category is low rent, subsidised public housing, characterised by single housing units which may be supervised by a trained janitor. The fifth and final category include "life care facilities" or "intermediate housing" types of residence. In the life care situation a number of housing alternatives are offered , ranging from cottages and apartments to rooms, that can cater for increasing levels of dependency. The intermediate housing facility more commonly have bed sitting rooms with lounge and amenities shared by small numbers of other residents, with centralised food provision and other recreational facilities. Golant does not mention institutional care.

While there are a wide variety of specialist elderly person's residences in Great Britain, the number of schemes of each type are small in relation to the United States. Local authority provision is the major source of specialist housing, although a significant number of voluntary organisations, housing associations and private entrepreuners also provide alternative care for the elderly. Specially planned elderly villages and elderly mobile home parks are not all common in Great Britain. The use of long term caravan sites as places of ameneity, such as coastal resorts, have however been favourite retirement sites for many elderly people. They offer relatively cheap forms of housing in areas where house prices are prohibitive, and allow migration for a relatively low income elderly group. Recent legislation to protect mobile home owners against exploitation by site owners had the elderly in mind as a key group facing this problem.

Karn (1977) has identified the existence of hotels catering almost exclusively for elderly people at holiday resorts. Little work is available on the existence of this sort of accommodation in urban areas however. The fourth of Golant's categories, low rent subsidised public housing, is equivalent to public sector sheltered housing units in this country. These units are a major feature of district housing authority services for the elderly and usually involve independent living by tenants with warden supervision, an emergency alarm system, and in some cases communal facilities (Ministry of Housing and Local Government, 1969). While these units are usually quite small (around 30 places to one warden) they can have the effect of artificially increasing the proportion of elderly people in small neighbourhoods or estates.

A number of more recent trends in domiciliary and residential care have had an influence on dependency levels among elderly people living in sheltered housing units. Many local authorities have reported that policy developments in the field of community care have led to more dependent elderly people being coped within their own homes. A filtering process has inevitably come into play, and this change has been reflected in the residential sector. Those living in sheltered housing units have increasingly been the more dependent, and exhibit some of the disabilities that may once have been coped with only in elderly person's homes. The levels of dependency in local authority elderly persons homes has become more like those of long- stay geriatric wards in hospitals, especially in the extent of mental confusion and mental disorder among elderly residents.

There has also more recently been a movement by some local authorities towards a form of very sheltered housing which has more in common with Golant's "intermediate housing." The concept of very sheltered housing has the same components as normal sheltered housing, but includes levels of support and care consistent with more dependent elderly people. This might take the form of a permanent home help or residential care input to those housed there, rather than help being provided to individual residents where necessary. Other forms of very sheltered housing have been developed by putting limited care and support into existing clusters of elderly people, such as in normal flats occupied by a large proportion of elderly people.

There have been many housing associations that have developed sheltered housing in association with local authorities. This has added to the importance of this form of housing in the urban landscape of the elderly.

Large-scale local authority institutional population's can obviously have a great effect on local statistical incidence of elderly populations. In relation to the local prevalence of disability and handicap these are not significant, with prevalences being primarily measured in

relation to those living in the community. The role of private and voluntary residential care is less clearly defined. Surveys of the disabled are not always clear on whether these institutions are included in estimates of community prevalence rates. While there is a duty to register such establishments with the local authority, some may cater for 10 elderly people or less, in normal sized housing with only improved fire safety arrangements. It is unclear whether these are universally regarded as institutional populations. There has been a boom in the private sector elderly residential care market, due to the present central government policy of subsidising many private sector placements of people with handicaps to increasing levels of subsidy (Churchill, 1984). In many authorities the private and voluntary sector provide an equal number, or perhaps greater numbers of places than local authority residential provision. The location of many private sector residential facilities in areas of high ameneity, or in areas perceived by owners to be attractive to elderly residents, represents potentially a major influence on patterns among the elderly.

5.5 Differences in Levels of Disability among the Elderly

While elderly people can be found to concentrate spatially, these concentrations are not socio-economically heterogeneous. Evidence on the role of the elderly in the South West Region already presented has shown that large scale migration of the elderly into the area consists largely of relatively affluent middle class ex-professional and managerial groups (SWEPC,1975). Peace (1979) in her study of the elderly in Swansea looked at the socio-economic group correlates of areas with large elderly populations. She noted that:

> "the Townhill council estate stands out as a low status area with a high percentage of elderly residents, as do the Penlan estate and parts of West Cross and Sketty Park. In contrast Uplands and Sketty are seen as areas of high status and owner occupation, yet with a high proportion of elderly residents. A trend is also noted in the Mumbles area although socio-economic status is more diverse."
>
> Peace (1979,pp102)

The higher status elderly areas of Uplands, Sketty and Mumbles are coastal locations and perceived as having high ameneity status. Differences in social status between areas having many elderly people do not necessarily have to occur by processes of migration by higher status elderly people. All of "unplanned" processes of elderly concentration can effect predominantly high social class, middle aged residential areas, as well as similar low social class residential areas. Table 5.4 shows that clusters of elderly people

Table 5.4 : Tenure of housing occupied by elderly by socio-economic grade

Housing Tenure	Socio-Economic Grade (%) AB	C1	C2	DE
Owner Occupied	85	65	44	30
Rented (Local Authority)	6	17	39	48
Rented Privately	9	18	16	22

Source : Age Concern (1980; Table 3.2, pp 10)

Table 5.5 : The prevalence of limiting chronic sickness by age, sex and socio-economic class

Socio-economic Class	Sex	Age (%) 0-15	16-44	45-64	65+	All
Professional	M	4	17	14	19	10
	F	3	10	10	12	10
Employer/Manager	M	6	9	17	35	14
	F	4	10	20	43	15
Intermediate and Junior Non-Managerial	M	6	8	28	37	14
	F	4	8	24	48	17
Skilled management and own account	M	7	11	27	40	16
	F	6	12	23	45	17
Semi-skilled manual and personal services	M	8	12	30	38	20
	F	6	12	32	48	24
Unskilled manual	M	7	11	35	33	19
	F	6	18	35	45	31
All	M	7	10	26	38	16
	F	5	11	20	47	19

Source : OPCS (1981, Table 6.7)

can potentially contain elderly people of very different social class. 85% of professional and managerial elderly lived in owner- occupied housing, and only 6% in local authority rented accomodation. Those elderly people with semi-skilled or unskilled manual occupational backgrounds, only 30% lived in owner-occupied dwellings, 48% living in local authority housing. The geography of housing tenure can therefore, have an influence on the social composition of concentrations of elderly people.

Golant (1975) has demonstrated that in planned or quasi-planned elderly residential areas, social class differences do exist. American retirement villages were more likely to come from professional and managerial occupational backgrounds than from any other. In contrast retirement hotels exhibited elderly population from previous low status occupations, such as clerical and sales workers.

The existence of a social class dimension under-pinning spatial patterning among the elderly is important in the context of explaining patterns of disability. This is because if one is of professional or managerial social class, whether elderly or young, the less likely one is to suffer from disabling illness then those of the same age of lower social class. Table 5.5 shows the prevalence of limiting chronic sickness across the main socio-economic group categories for those of all ages derived from the General Household Survey of 1981 (OPCS,1981). This demonstrates that while 19% of professional men suffered from limiting chronic sickness, this rose to 38% for semi-skilled manual men, and to 40% for skilled manual men. This relationship holds across all age groups, not purely for the elderly. The social class dimension is a factor to be taken into consideration when trying to assess the contribution of other age groups to the spatial patterning of disability. The whole issue of a persons social class, and its relationship to the incidence of ill-health is discussed in the wider context later in this chapter.

A number of conclusions are to be drawn from the evidence presented in this section. Firstly, the elderly are not uniformly distributed across space, at any spatial scale. While certain members of that elderly population have an element of choice in where they choose to live, these are mainly the minority having a high income in retirement. There is then, a tendency for those elderly in the population at present to have aged in the homes they moved to when they married, or in their middle age. Where housing developments have attracted families of similar ages, the potential exists for concentrations of elderly people in that area. A number of other mechanisms have been identified through which localised concentrations among the elderly can developed. These include local elderly communities specially designed to cater for old people, such as sheltered housing units, residential hotels, or small private elderly persons homes.

Secondly, a separate dimension has been identified in

which clusters among the elderly are found to be socially homogeneous. The fact that social differences in the incidence of disability exist has been alluded to, and this means that spatial variation in social class among the elderly can potentially have an effect on patterns of disability.

The fact that elderly people exhibit far higher levels of disability than is to be found in the population in general, and are found to be effected by identifiable spatial processes, can lead us to a partial explanation of patterns of disability in the community. The next section goes on to look at the influence of social class on prevalence of disability.

5.6 Social Class and Inequalities in Mortality Rates

It has been shown in previous section that levels of disability are not distributed uniformly across space, and that the spatial pattern exhibited by the elderly in any area will have a significant effect on the pattern of disability observed. In addition the environment in both the work place, and in the residential setting has been shown to have a significant influence on spatial patterns of ill-health, and therefore potentially effect patterns of disability. Ill-health has been associated with a number of features of poor residential provision which can promote ill-health, such as damp or over-crowding, and also with a set of social milieux for which the causal mechanisms are less open to identification. Here a complex set of socio-economic characteristics and environmental conditions are together found to promote higher than average levels of ill-health. These include positive relationships between hazardous environments and particular types of residential areas, reduced access to health facilities in terms of both distance, numbers of facilities, and their quality for those living in these areas. In addition there are a number of cultural factors that influence the take-up of health services, and these are related to occupational class.

The inter-relationships between these adverse social factors are complicated, but relate mainly to aspects of poverty and deprivation. A common link is however formed by the influence of social class on whether any of these adverse conditions pertain, and this in turn may be related to the disadvantaged position working class people occupy in a capitalist economic system. The identification of "social class" as a factor in health inequality at the aggregate scale is only an explanation at one level. The more detailed questions of why social class, derived as it is from the occupation of an individual, should be associated with higher risk of ill-health, and what the causal mechanisms may be, also need to be addressed. Social classes are not uniformly distributed spatially, and when linked to the fact that lower social class populations may experience higher rates of ill- health and disability, this means that an understanding of social inequalities in health is a pre-requisite for understanding the social geography of

disability.

The most consistently available source of information on social differences in ill-health is on cause of death, where both cause of death and occupation are registered and certified. By dividing the number of deaths in any occupational class by the total number of people in that class in the population, an index is produced by which class comparisons may be made in mortality of different classes. There are of course many difficulties inherent in both the definition of occupation, and in the method of deriving the index which make interpretation complicated. Firstly there is some contraversy over what relationship exists between pattern of mortality and patterns of ill-health, it being suggested that the two patterns are not necessarily the same, and that it is therefore difficult to predict ill-health from information on mortality (Whitelegg,1982;pp 27).

Secondly, difficulties are found in recording the occupation of individuals, especially among the elderly. It is not always clear whether coding needs to be based on the last occupation the person had, or on the occupation they were in for the largest period of their life. As far as the wider aspects of social class are concerned, it is unclear which of the occupational roles is more relevant (Townsend and Davidson,1983;pp 56).

Thirdly, in the context of disability or long-term illness, it is not always clear whether the person involved would have suffered significant impairments, or the restriction in daily living associated with disability, before they died. It is therefore difficult to move directly from statements on class differences in levels of mortality, to statements on class differences on levels of disability. However, as we shall see, local and national studies support the statement that class differences in mortality are reflected in class differences in health and disability (Whitelegg,1982; Townsend and Dickenson,1983; Brotherston,1976; Blaxter,1976).

In 1980 the report of the Working Group on Inequalities in Health (the Black Report) was published (Black ,1980), and it represented one of the most comprehensive over-views of the way in which class differences in health persist over time that has yet been published. The report was edited and in part up-dated by Townsend and Davidson (1983). It is from the latter version that much of the evidence presented here is taken. Townsend and Davidson show quite clearly that unskilled manual workers of social class V, aged 15 to 64 years of age are 2.5 times more likely to die within that age range as professional workers in occupational class I.

Blaxter (1976) points out that those people in social class V are occupying a disadvantaged position in relation to a number of diseases over time. She identifies two types of disease, the "old" diseases that are traditionally associated with poverty, such as

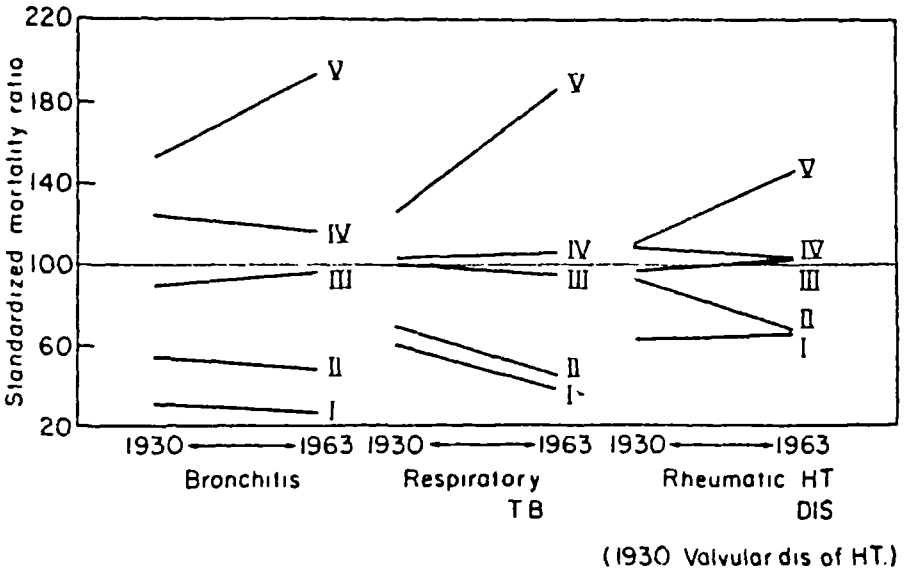
Bronchitis, Respiratory Tuberculosis, and Rheumatic Heart Disease, and a set of "new" diseases associated with affluence, including Diabetes, Coronary Heart Disease, and Appendicitis. Figure 5.1 shows that for the "old" diseases mortality has fallen or remained stable for occupational classes I,II,III, and IV in the period 1930 to 1963, mortality rates due to these causes have risen for occupational class V. The net effect has been to widen the difference in mortality rates that already existed in 1930. Even more disturbing is the sharp rise in mortality due to the "new" diseases over the period among those in classes IV and V, reaching a level where for the first time rates for these classes exceeded those experienced by classes I and II, whose mortality in this category fell during the period. Brotherston (1976) confirms the fact that little evidence exists to suggest that social class differences in mortality are decreasing at present.

Walters (1980) has identified higher rates of mortality among people of lower occupational class extending into death due to Diabetes, vascular lesions of the central nervous system, and Coronary Disease. He also points out an emerging dominance among classes IV and V since 1930 in the rates of mortality due to Lung Cancer and through Duodenal Ulcers. Using figures for 1930-1932, 1950, and 1970-1972, Walters[1] demonstrates the widening of social differences, with occupational classes V having higher rate of Respiratory Tuberculosis, Bronchitis, and Cancer of the stomach in 1970-1972, than were experienced in 1930. Occupational classes I and II do exhibit higher rates of Poliomyelitis, Leukaemia, Breast Cancer, and Cirrhosis of the liver over the same period.

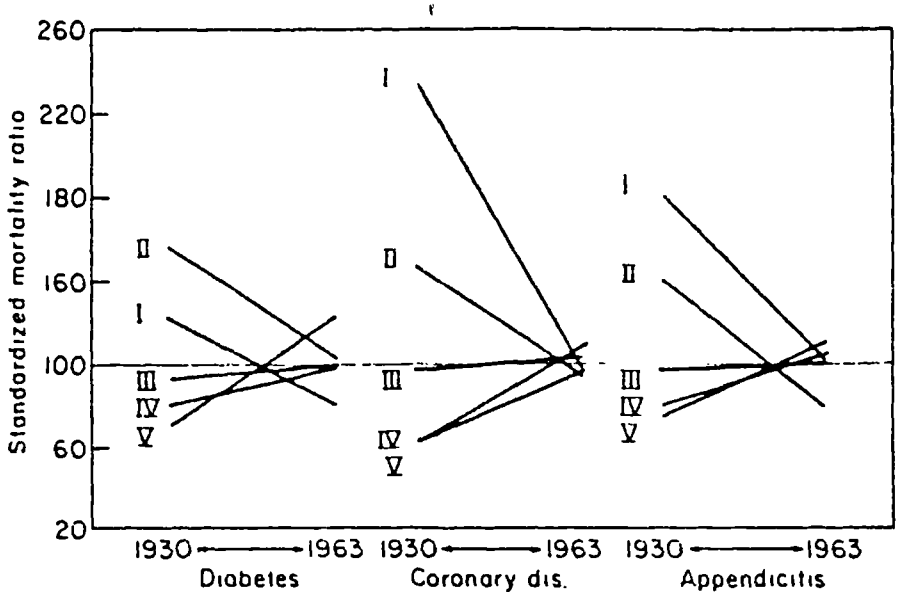
These differences between occupational class mortality levels do exist irrespective of the age and of the sex of those class groups studied. Townsend and Davidson (1983) show that from birth to one month old, mortality rates for unskilled manual occupational classes (V) are twice those of the higher occupational classes (See Figure 5.2). Up to the age of one year the mortality rate of male children of unskilled manual families are three times that of higher occupational classes, with rates for female children exceeding this figure. The most common causes of death were found to be accidents and respiratory disease. For children aged 1 to 14 years of age the class differences narrow, but are still found to exist. The ratio for occupational group V against group I is 2 male children deaths for every one in the higher occupational class, and 1.5- 1.9 to one for female children. The major causes of death here were again accidents, infectious diseases, parasitic diseases, and pneumonia.

Among those aged 15 to 64 there are hidden differences, with those aged 20 to 30 years of age having a large class difference, and those nearing retirement age having less marked differences. Once again accidents and

Figure 5.1 : Mortality Trends for "Old" and "New Diseases by Social Class



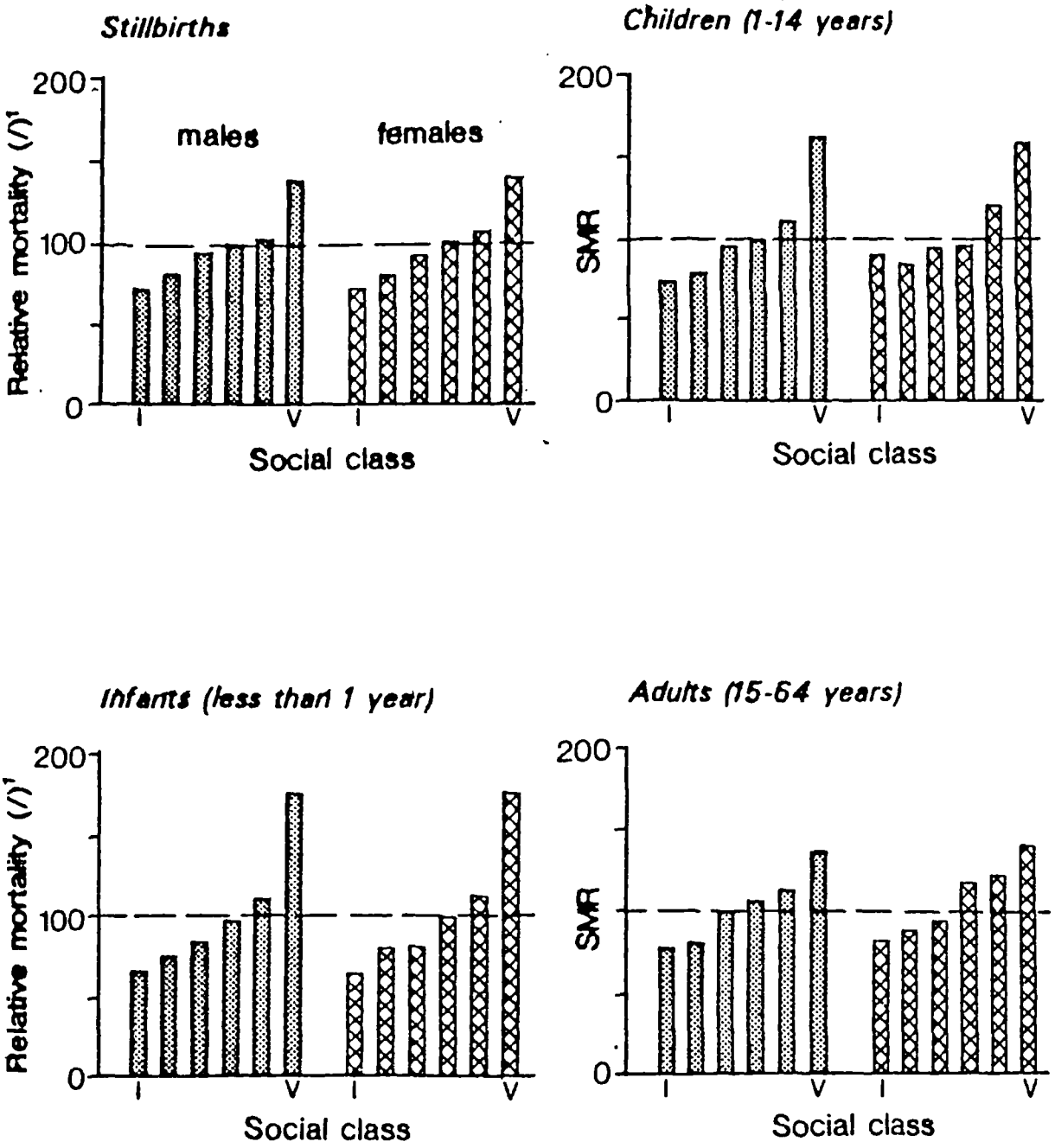
Some 'old' diseases: trends of mortality ratios. Men, 1930–63, ages 15–64, England and Wales



Some 'new' diseases: trends of mortality ratios. Men, 1930–63, ages 15–64, England and Wales

Source : Blaxter (1976, pp 114)

Figure 5.2 : Occupational Mortality, 1970-1972



Source : Townsend ane Davidson (1983,pp 61)

Note 1: Relative mortality (%) = ratio of rates for the social class to the rate of all males/females.

infectious diseases show steep class gradients, with non-infectious diseases such as cancer, heart disease and respiratory disease also showing significant class differences. As has been suggested by Blaxter, and Brotherston, the trend over time seems to be for the divergence of rates of mortality beween classes, the rates for lower even at a time when mortality rates are falling overall. Official figures reveal that present trends in divergence represent an increase or stand still for males aged 35 to 65 years of age in occupational classes III, IV and V, while those for classes I and II continue to fall.

Inequalities in the 1970's reflect changes in mortality rates for older men, and are based in changes in causes of death. In 1959-1963 those people in occupational classes IV and V accounted for 49 out of every 85 observed male deaths (58%), while in 1970-1972 this had risen to 68 out of every 92 deaths (74%)(Townsend and Davidson,1983;pp 67-68).

There are, as has been mentioned in the introduction to this section, a number of special problems associated with linking occupational class to mortality. However, major differences are seen to exist between manual and non-manual workers. The Office of Population Censuses and Surveys have pointed out that mortality rates :

> "..for farmers, miners and quarrymen was 149, gas, coke and chemical makers 150 , and furnace, forge, foundry and rolling mill workers 162, compared with administrators and managers with a ratio of 88, and professional, technical workers and artists with a ratio of 89."
>
> OPCS (1978;pp 107)

5.7 Social Inequality in Morbidity

Information on morbidity in the population, or periods of non-fatal ill-health, come from sample surveys of the population, from information on consultations with General Practitioners, and from information on hospital admissions. As in the case of mortality the data sources are open to some criticism. Both consultations with GPs and some hospital admissions reflect not only the presence of ill-health in the individual, but also implicitely a perception on the part of the individual that he or she has something wrong with them, and a belief that attendance at a clinic or hospital will help them. The fact that some people feel disinclined to consult the health services even when ill, due to the negative attitudes they have towards the structure and appropriateness of those health services would influence consultation rates(Townsend and Davidson,1983). Additionally the only episodes recorded within this framework of information collection, are those that fall within a medical criteria of disease. It is difficult therefore, to be confident that different rates of consultation with doctors by class are true indications

of different rates of ill-health. Doyal (1979) has suggested that this perspective has limitations, as the absence of clinical disease does not mean that the person involved is "healthy", thereby masking some of the wider aspects of inequalities in health.

The ad hoc surveys and studies of primary health care consultations and hospital admissions do clearly show occupational class gradients in levels of health. In the first category of survey, a study of 92 GP's throughout the country selected age and sex stratified random samples from their client lists, including those aged between 40 and 64, with the aim of determining the levels of chronic bronchitis experienced in different areas (Logan and Cushion,1960). Observed levels of the disorder ranged from 6% among clients of occupational class I, to 26% in occupational class V. These authors also compare the levels of consultation for particular diseases for social classes, with the levels of the disease in the community implied by disease specific mortality statistics. These reveal that the level of consultation is nearer to the expected level of need for medical help for higher social classes, than is the case among people of lower social status. The implication of these findings is that those in manual occupational classes are more likely to suffer from these diseases, and they are less likely to seek medical help.

Blaxter (1976) has shown that prevalence rates for chronic illnesses suffered by those people in occupational class v are nearly three times the rate experienced by those in occupational class I, and that class differences are wider for those with chronic illnesses than for acute illnesses. Similar class differences are found when national statistics are taken into account. Table 5.5 shows the levels of "limiting long-standing illness" and "restricted activity" suffered by those in different occupational classes, and is taken from the 1976 General Household Survey. This table shows that unskilled manual workers(V)were 3 times more likely to suffer from a long-standing limiting illness than a person from a professional background.

In a study of incapacity to work due to sickness, prevalence rates standardized by age for employed males, recorded significant class differences per 1000 of the population in each occupational class (Ministry of Pensions,1965). For disorders of the respiratory system combined occupational classes I and II scored 93 compared to 177 in class V. For Bronchitis and Arthritis, comparable figures were 15 and 57 respectively, and for Rheumatism and Arthritis 7 and 40 respectively.

There is evidence that class differences also exist in the field of mental handicap. Marsfield (1962) draws attention to Anencephaly where incidence rates are four times as great for manual socio-economic groups as are found for those in professional groups. Marsland also suggests that the role of socio-economic factors "is unquestioned but difficult to evaluate" in the aetiology

of mental handicap. In terms of mild mental handicap the role of socio-economic factors becomes more identifiable. The National Child Development Unit are carrying out a survey which involves following through a cohort of children born at a specific time in 1958. They have found major differences in the education attainment of children , and it has been reported that children from occupational class V were 6 times more likely to be poor readers by the age of seven than children from occupational class I.

The children from lower social classes were 15 times more likely to be non-readers than their higher status counterparts, and most importantly, 45 times more likely to require education in a special school (Davie, Butler and Goldstein,1972). These findings are supported by Clarke and Clarke (1975;pp 19) who comment:

> "It is particularily from occupational classes V that the mildly (mentally) subnormal are drawn."

Wedge and Prosser (1973) in a study of children from the National Child Development Study previously mentioned, found that 1 in 4 children in the study had been brought up in families with 5 or more children, or with only one parent ,1 in 4 had lived in housing of poor condition, and 1 in 7 had lived in families with a low income. Those children living in 'families where all three detrimental circumstances were to be found represented 1 in 16 of the children in the study. It is from this group that the "very dull, backward and mildly retarded" were found mainly to be drawn. Strong links exist between the existance of these detrimental factors and low occupational class (Clarke and Clarke,1975).

5.8 Mortality, Morbidity and Disability

We have already seen that, apart from the case of mental handicap, it is difficult to translate observed occupational class differences in mortality and morbidity into class differences in levels of disability. A study by Townsend (1979,pp710) makes the transition by comparing incapacity scores for occupational classes direct from survey data. Table 5.6 shows the findings from the study, and it reveals in all severities of incapacity that semi-skilled and unskilled manual workers tend to be more prone to disability than their professional and managerial counterparts. The trend is observed for both men and women. For men experiencing minor incapacities the ratio of percentage of unskilled manual to percentage of professional people suffering from a disorder is 1.75, for some incapacity 2.7, and for appreciable or severe disorders, a ratio of 6.0. The equivalent ratios for women were found to be 2.9, 1.5 and 6.5 respectively.

The same pattern holds when age is taken into account. Table 5.7 shows the percentage of manual and non-manual males and females suffering a disabling condition. With

Table 5.6 : Percentage of males and Females aged 10 and over in different occupational classes, according to incapacity

Sex and Incapacity (Score)	Prof. & Manag'l	Managerial	Supervisory Higher	Supervisory Lower	Manual Routine	Manual Skill	Manual Semi	Manual Un-Skill
MALE								
None (0)	88	90	87	84	82	85	80	70
Minor (1-2)	8	4	6	7	7	5	10	14
Some (3-6)	3	4	3	5	5	5	7	8
Appreciable or Severe (7+)	1	2	4	4	4	4	3	6
Total	100	100	100	100	100	100	100	100
Sample size	177	146	279	397	166	940	483	298
FEMALE								
None (0)	85	78	83	80	76	72	72	58
Minor (1-2)	7	8	7	8	8	9	11	20
Some (3-6)	6	8	6	7	9	10	9	9
Appreciable or Severe (7+)	2	5	4	5	7	9	8	13
Total	100	100	100	100	100	100	100	100
Sample	175	148	297	440	317	910	485	273

Source : Townsend (1979; Table 20.8, pp 710)

Table 5.7 : Percentage of non-manual and manual males and females of different age, with one or more disablement condition

	Male		Female	
Age	Non-manual	Manual	Non-manual	Manual
0-9	1.3	2.6	1.0	2.1
10-19	1.7	3.8	3.2	1.9
20-29	2.9	4.9	7.0	9.7
30-39	4.6	7.5	8.6	13.6
40-49	8.3	7.0	11.3	17.6
50-59	13.8	21.9	14.0	23.0
60-69	25.0	25.5	20.2	30.7
70+	36.4	45.6	45.3	42.0
All ages	7.4	11.2	10.8	16.2

Source : Townsend (1979; Table 20.9, pp 711)

the exception of women aged 10 to 19, and aged over 70, and men aged 40 to 49, manual rates are generally found to be higher than those observed for non-manual occupations. The ratios ranged from a maximum of 2.2 for young men aged 10 to 19, to a minimum of 1.02 for men aged 60 to 69.

5.9 Inequality in Health and Disability - Potential Explanations

The report of the Working Group on Inequalities in Health identified a number of possible root causes of occupational class differences in mortality and morbidity rates, based on notified causes of death and other relevant research (Townsend and Davidson,1983;pp123-133). These explanatory factors varied between different age groups. For disability and deaths among children at birth and early infancy, a number of possible reasons are advanced, varying for still-birth or perinatal death and disability, and for death and disability in the post-neonatal period. For the earlier period, the age of mothers and the size of their existing families are general indicators of high rates of mortality. While family size is socially related, when age and family size are contolled for in analysis, social class remains a significant factor in the determination of mortality rates around the time of birth, with manual occupational classes recording higher rates than those in professional and managerial classes. Illsley (1955) suggested that a process of natural selection in marriage was to blame. It was suggested that men of higher occupational status tended to marry women who, by coincidence, had characteristics that were beneficial to successful child bearing. In this way higher status families were thought to be pre-selecting their abilities for unproblematic child birth.

A second method of selection was proposed by Baird (1974), the mechanism for class differences in mortality being "transmitted nutritional deprivation." Here the poor nutritional intake of the mothers of pregnant women was suggested to influence the ultimate health of the child at birth. Baird (1974) suggested that a poor maternal nutritional intake could lead in the second generation to low birth weight in children for this group of mothers, with low birth weight being itself linked with mortality around the time of birth, congenital malformations, and disability among surviving children. Townsend and Davidson (1983,pp123) cite a number of research studies where low birth weight has been associated with the health of mothers during pregnancy, and with the quality of obstetric care they receive or avail themselves of. Maternal health and the provision and take up of obstetric services are suggested to be themselves class related.

In the first year of life it is suggested that material deprivation among families plays a major role, with death due to respiratory disease and accidents exhibiting

steepest class gradients. Income is suggested to be an influence in the outcome of an accident, or in whether respiratory disorders develop or are successfully combated. The relationship is one that results from higher incomes being generally related to a safe and unpolluted environment for the families involved, and from higher incomes meaning an increased ability to react more quickly than others to a medical emergency.

> "The most obvious of such factors fall within the sphere of material resources: sufficient household income, a safe uncrowded and unpolluted home, warmth and hygiene, a means of rapid communication with the outside world, for example a telephone or car, and an adequate level of manpower-or womanpower (two parents would normally provide more continuous care and protection than one)."
>
> Townsend and Davidson (1983,pp 124)

In addition there are psychological factors effected by class, which include motivation to care for children, and educational ability among lower class parents, which can be related to ability to communicate problems or attain and act on information relevant to child care. The role of parental awareness of the importance of nutritional input to children is crucial, both in terms of the risk of physical ill-health of children, and in their mental development (Birch, Eichenwald and Fry,1969; Birch and Gussow,1970). Cravioto, DeLicardie and Birch (1966) have noted that malnutrician in early childhood can effect the development of children's mental abilities. This can be through directly retarded brain growth, or by association through a lack of interest in their surroundings by such malnourished children and subsequent understimulation. It can also come about through a reciprical apathy on the part of mothers to malnourished, and therefore apathetic children. Dobbing and Smart (1972) widen this perspective by pointing out that malnutrition does not usually exist in isolation, and that it should be regarded as one other factor among many other related factors that can reduce a child's intellectual capacity. They suggest that from late gestation to the second year after birth, spurts of intellectual development occur, and that if these growth stages are interupted the brain will never achieve it's full potential for development.

Among young children from age one to fourteen, accidents again play a significant role in the differences in mortality between classes, along with respiratory disease. Leeder, Corkhill, Irwig, Holland and Colley (1976) in a study of children in Harrow found the major correlates of respiratory illness in those studied were Bronchitis and Pneumonia in siblings, and parental smoking, influencing the pollution intake of children. The incidence of these disorders was higher where the family included larger numbers of children thereby increasing the likelihood of cross infection, and a parental history of respiratory illness. Smoking and

family size are related to social class and offer a mechanism by which occupational class can be translated into disabling respiratory illness. Environmental pollution has been found to be an exacerbating factor rather than a major influence in class differences in the disease (Colley and Reid,1970). Parental history of lung disease is an influence and it is recognised that this may be related to previous hazards in employment, which can again be class related. Miller, Court, Knox and Brandon (1974) make the final important link with disability, showing in a study in Newcastle that repeated respiratory infection in early childhood can lead to permanent damage and disability by the age of 15.

In trying to understand the social roots of accidents as a major influence on childhood ill-health, Townsend and Davidson (1983, p 27) attribute them to both environmental hazard and dangerous behaviour, these involving material factors and cultural characteristics related to occupational class differences. In the material sense, lower incomes among manual workers can be reflected in lower quality and less safe home furnishings and heating systems. The lack of access to material resources among families of lower occupational classes often leads to a need for both parents to work, with potential for a reduced level of supervision that can be given to these children. Different levels of access to housing of a high quality can be reflected in a lack of garden space or the lack of an area where children can play observed by parents or other adults. When linked with the working arrangements of lower occupational class families, an association can be made with children of these families spending more time on their own during school holidays, and potentially in more hazardous environments. All of these issues can provide a logical framework for linking occupational class, through a lack of material resources, to a subsequent increased risk of accidents and disability.

The material problems can be compounded by the higher incidence of stressful life events within lower occupational class families, often itself reflecting material deprivation. This can reduce the ability of mothers to keep up a comprehensive and vigilant protection for their children (Brown and Harris, 1978).

Among adults the causes of class differences are more complex and it is more difficult to unravel systematic causal relationship. Townsend and Davidson (1983) see the division of work types between the manual and non-manual occupations as the root cause of many of these differences. As manual workers those people in the lower occupational classes have a tendency to be more regularily exposed to risk of injury, and to the work environments and manufacturing by - products that threaten the onset of long-term injury and disability. The actual differences between manual labour and clerical and administrative work may in themselves entail the earlier "wearing out" of the body and subsequent disability. Beyond these more obvious mechanisms for

occupational class differences in mortality and disability, the explanations for links between material deprivation and the "new" crippling diseases such as cancer, circulatory disease and cerebral vascular accidents remain less clear. One element that may be associated with some of these diseases is smoking, although the link remains controversial. While the number of people who smoke continues to drop in this country, it is falling more rapidly among those of higher occupational classes than among other groups, and significant class differences in incidence of smoking remain. These class differences are shown in Table 5.8. The reasons for this difference in prevalence of smoking between classes may be differences in the rate in which information on "good practices "in health are taken up, and may also involve cultural differences between classes in the acceptability of smoking as a social act.

Finally in old age two themes emerge. Townsend and Davidson (1983) suggest that it is in old age that the accumulated risks encountered by those in lower occupational class groups take their toll, and result both in the higher death rates experienced by lower occupational class groups, and higher levels of disability. In addition there are certain rewards associated with higher occupational class status in society, the results of which can protect those of higher occupational class from deprivation in their old age. The role of the elderly in society is such that retirement can be a time of low income and of real material deprivation. If one has been able to amass savings over a working life that has afforded one certain advantages materially , or which has provided an above average income level through occupational pension benefits, then one may be faced with fewer problems in retirement. This can lead to reductions in day to day stress in one's life, can ensure an ability to buy in personal help when and if required, can ensure a better diet, and can in general support a healthier life style than might be the case on lower pension incomes. The end result may often be a reduction in the risk of substantial disability in old age. Table 5.7 confirms this, as 36.4% of non-manual male workers aged 70 or over experienced a disability of some kind, compared with 45.6% of those from manual occupational groups. The pattern is the reverse for women aged over 70, but this may be due to women from non-manual occupational classes tending to live to an even older age than women generally. The result may therefore be a higher proportion of very elderly people among the non-manual group, with an increased tendency for disablement to occur in that retired population in general.

5.10 A Theoretical Framework for Explaining Class Differences in Health

Townsend and Davidson (1983) have provided four categories of theoretical framework within which to place explanations of social inequality in health, of which they have advanced a materialist (or structuralist)

Table 5.8 : Cigarette smoking by socio-economic group
(Males and Females aged 16+, 1980)

Socio-Economic Group	Current Smokers (%) Males	Females
Professional	21	21
Managerial	35	33
Intermediate Non-Manual	35	34
Intermediate Manual	48	43
Semi-Skilled Manual	49	39
Unskilled Manual	57	41
All	42	37

Source : General Household Survey : OPCS Monitor, 28th July 1981

framework as having the most utility. From this theoretical stand-point, the distribution of wealth and material resources through economic and social structures within society, is seen as being the key factor in determining the distribution of health and well-being. A variety of themes are developed within this overall materialist framework, the most influencial being the description of the ways that the capitalist mode of production can create inequality in access to material resources, and inequality in the exposure to the risks of ill-health . This theme also recognises that inequality is a relative concept, and as such inequality can exist between classes at any point in the continuum of economic development, and will be reflected in the comparative quality of health between the classes. Within this theoretical framework, the fact that the wide spread infectious diseases and high levels of mortality associated with the industrial squalor of the nineteenth century in Britain had now been virtually eradicated , would not invalidate the fact that class inequalities in health continue to exist in the environment of newly acquired affluent standards of living.

Townsend and Davidson (1983) suggest that while the internal operation of western capitalist economies can restrict the income of some sections of society and effect their health directly, the operation of that economy can also control the distribution of high risk environments and of the factors that promote health between the classes. The division of labour necessary to maintain a profitable industry brings with it the division of risk. People of lower occupational class come into direct contact with dangerous industrial processes and waste products, while people of higher occupational class are found in less hazardous administrative roles. The economic imperatives that fuel this division of labour are also to be found reflected in the structure of housing provision, in the education system of the country, and in the provision of preventative and remedial health services to the various sectors of the community. Unequal access to these essential services is seen to differ with the occupational class of those involved, and the use of such provision is seen by Townsend and Davidson as being of prime significance to the health and levels of disability experiences by the social classes involved.

Whitelegg (1982) has described these imperatives and how they may lead to institutionalised inequality. He points to the fact that in most countries where a capitalist mode of production is in operation, income remains the main determining factor in the welfare, and the well-being of the people, and that the distribution of income is unequal. Evidence to support this observation is presented by Atkinson and Harris,1978;pp159). They show that the 20% of the population who earned the lowest levels of income received on average only 5.6% of the total incomes received by those in the United Kingdom between 1971, and 1975. This may be compared with those

in the highest 20% income bracket who received 41.1% of that total income. Similarily wealth rather than income is found to be concentrated in the hands of a relatively small number of people, 64.3% of the British wealth being controlled by 5% of the population.

Whitelegg (1982) goes on to show that in a Marxian critique, income is derived by the sale of labour by those without wealth or capital resources, to those who do have wealth and capital. "Surplus value" is derived, being the difference between the value generated by the labour of the worker and the amount the worker is paid. The process of transfer of value from the worker to the owner is termed the "expropriation of surplus value", and results in the accumulation of wealth and capital with those who originally controlled it. To ensure that profit is maximised, division of labour takes place, with the work being split into specialised skilled and unskilled functions, leading ultimately to the creation of social or occupational classes. Inequality becomes inherent within the wage system, with higher status and income accruing to those engaged in specialised skilled and non-manual employment. Peet (1975) has identified the reasons for wage inequality. A wage can be thought of as including within it not only the cost of bodily subsistence, but also as containing the cost of keeping the worker content, and of fueling continued economic growth. Most significantly the wage has to include the cost of replacing workers of the appropriate kind, and therefore the cost of bringing up and educating children to an appropriate level of skill. With a division of labour, the level of skill required at each level in the hierachy becomes more segregated, and Peet argues that levels of education need to be different. Wage costs must necessarily be unequal to reflect the variation in the different need for an educated and skilled labour force.

In successive generations income differentials are passed on by middle class families through their ability to educate and socialize their children into appropriate roles in industrial society. This institutionalised and self-reproducing inequality in income between occupational group inevitably leads to inequality in access to material resources. This lack of material resources has been demonstrated to be influencial in causing ill-health (and therefore disability) by Townsend and Davidson (1983). The spatial segregation of social environments is felt by Peet to be a major element in this process of reproduction, and can provide a link to the spatial organisation of ill-health and disability.

Doyal (1979) has provided a useful four category model to explain how occupational differences in levels of ill-health can emerge within developed countries operating with a capitalist means of production. These categories, while linked to income, have a direct influence in their own right:

1. Production and the health of workers

2. Production, pollution and health
3. Consumption, health and illness
4. Stress as a source of ill-health

This work provides the link between the political economy and the example mechanisms by which health inequalities are transfered that have been identified by Townsend and Davidson (1983). In relation to production and ill health, the need to divide labour functions has not only led to income differences, and the generation of social classes, but as we have seen, to the redistribution of occupational risk. This provides a cause for differential levels of ill-health and disability over and above the influence of low income and the lack of material resources that result. Whitelegg (1982,pp 30) notes that while many of the worst effect of hazards have been reduced in mines and factories, occupational disease and injury still figured as a large source of reported ill-health. Robens has reported that 500,000 injuries were caused, and some 23 million working days lost in 1972 due to industrial injury and disease (Dept. of Employment,1972) illustrating the scale of the problem even today.

The second category of explanation for occupational class differences in health put forward by Doyal concerns the relationship between production, pollution and health. The close physical relationship between workers and some forms of industrial production provides the close at relationship between production, pollution and health. With lower disposable incomes, workers of lower occupational class have a tendency to live closer to their work, being less able to afford additional costs of living further away from their work-place. These groups are therefore, not only more likely to be ill as a result of the work that they do, but also are more likely to be effected by any pollution that is produced by the industries that they work within.

Individual factors based within the family have, as we have seen, a more significant role to play in health, especially where children are concerned (Colley and Reid,1970). These are mainly related to the previous history of chest disorders for parents and other siblings, and is to an extent dependent on whether the parents of the children smoke or not. There is, however, a potential for "viscious circles" to develop in which the external and internal pollution come together, at least in the case of respiratory disorders. Parents who work with industrial processes which effect their lungs may then have a higher probability of passing on their respiratory ill-health to their children. Air pollution from those same industrial processes can exacerbate the problems still further. The problem of poor respiratory health can then be reproduced between generations and within classes.

In the third of Doyal's categories, patterns of consumption within capitalist economies are seen as a major influence on ill-health and disability. Doyal sees

the main driving force as being the concentration on creating profit rather than on the needs of the community that is most predominant in advances capitalist countries. The result of this, it is suggested, is a lack of regard for the health of people within the community. The tobacco industry and smoking is the most obvious and most often quoted example of the contradiction between the need to promote consumption and therefore profit, and the consequences in terms of ill-health for the consumer. It can be argued that smoking is the major source of self-generated ill-health in the western world. The tobacco industry controls a massive amount of resources and uses these in advertising and marketing it's products to maximise its profits. The industry has had the tacit support in the conduct of its work by a succession of governments in the United Kingdom, due to the massive tax revenues generated through the consumption of cigarettes. The resources provided for educational campaigns aimed at reducing cigarette smoking are tiny in comparison the money spent on promotion and advertising of these products. The results of smoking, while still contraversial, are thought to be an increased risk of circulatory disorders, heart disease, lung cancer, perinatal and neonatal mortality, and low birth weight babies (with a related risk of death an disability for the child). As we have seen smoking is class related, and as a result must be seen as a significant cause of occupational class differences in health (Todd,1976).

Whitelegg (1982,pp 32) has also mentioned the changes in dietary habits generated by the search for profit among food manufacturing companies as a potential source of occupational class differences in health. These dietary changes include moves in the past towards the consumption of white bread and "fast foods" which are all geared to the mass market. This may well have a disproportional effect on lower occupation class groups who have been shown to be less receptive to information on health care, and less likely to be able to afford higher quality and healthier foods.

Finally Doyal has identified the effect of stress as influential in both the onset of phsychiatric illness, and physical illness. Although relatively little work has been done on the causal links between social condition, the incidence of stress can as a concept bring together the combined effects of social inequality and detrimental living conditions with the incidense of ill-health. Brenner (1973) has used the concept of stress to explain the link between aggregate increases in unemployment and upward trends in indicators of ill-health in the population, while Eyer (1977) uses the concept of stress in a slightly different way to argue an opposite position. From Eyer's position ill-health is seen as being reduced on the aggregate scale during periods of high unemployment due to the weakening of institutional pressures to consume during these times. Eyer sees unemployment as a source of relief for workers from the stress involved in work, and as a time when social

cohesion and support is increased in the community to cater for the problems ingendered by a cycle of large scale unemployment. It must be said however, that this concept runs against popular conceptions of what the consequences of unemployment are, in terms of additional problems and therefore additional stress. Unemployment tends to effect those in manual and unskilled professions disproportionately in relation to those in professional and managerial groups, and may therefore be seen as a source of inequality in health between occupational classes.

In conclusion a structuralist view of society provides a framework within which differences in access to material resources between occupational groups, and the reproduction of these difference between generations, can be explained. The results of these differences in access to resources can be seen to be transfered through a number of mechanisms, some related to age and stage in the family life cycle, into class differences in the prevalence of ill-health and disability. The structuralist analysis also provides a number of explanatory factors involving risk in particular occupations, environmental pollution, consumption of goods, and stress that can potentially influence occupational class differences in health and disability. These are related in only a secondary way to differences in income between these classes. In addition a structuralist perspective can be directly linked to the analysis of Oliver (1979), presented here in Chapter 1.5. Those of lower social class face a double jeopardy in which they are more prone to disability, and when disabled my find themselves of reduced status because of their marginal position in relation to the labour market, finding themselves in receipt of only minimal levels of state support.

5.11 Genetic Sources of Variation in Disability

Where a genetic pre-disposition exists among an identifiable group for contracting a disabling disease, there may also be the potential for spatial patterning of the incidence of that disorder. The potential for this as an explanation is illustrated by a study carried out by Borman (1980). Borman points out that in New Zealand a higher incidence of Diabetes Mellitus has been found among Moaris than among Europeans. He examined data from the 1971 Census which contained a question for those being treated for the disorder. Borman was able to identify areas with statistically significant levels of Diabetes morbidity that were highly correlated with the proportion of the population of Maori extraction. Despite incidence levels for the population generally varying, and low incidences for these groups being found in the north of North Island, the influence of the Moari population was such that the overall incidence was inflated to significant high levels. Within the definitions adopted in Chapter 1, Diabetes would be regarded as a disabling disorder. In addition there are significant relationships between Diabetes and other more

directly debilitating disorders, such as blindness, and circulatory disorders, some even leading to gangerine and amputation in later life.

There has also been evidence that a number of congenital defects that can be found in the United Kingdom may have genetic links. Both Anencephaly and Spina Bifida are both related to a failure of the Neural Tube to close before birth. A number of authors have pointed to there being a link between Anencephaly at least, and people of Celtic races (Edwards,1958; Pleydell, 1960; Laurence, Carter, and David, 1968; Elwood, 1972). While unable to identify a clear independent effect for racial background, Calvert (1979) was able to demonstrate spatial clustering of Anencephaly within Northampton, mainly due to the influence of Corby, a focus for both industrial activity, and Scottish expatriates. There was however, no evidence of spatial patterning within Corby itself, implying that with this disorder, the patterns may be dependent on the size of industrial or racial congregation.

It would appear from the analysis provided in this chapter, that strong reasons exist for our very economic order being translated into unequal likelihoods of different age and occupational groups experiencing significant levels of disability. The age and occupational class composition of an area can therefore, be assumed to have a profound influence on the level of disability observed in that area. In particular circumstances and at particular scales, genetic influences may also be detectable. In the next chapter the relationship between the onset of disability and subsequent socio-economic status is reviewed, to determine the influence this may have on the locational behaviour of the disabled.

CHAPTER 6

DISABILITY AND LOCATIONAL BEHAVIOUR- A CONCEPTUAL MODEL FOR THE EXPLANATION OF URBAN PATTERNS OF DISABILITY

6.1 The Effect of Disability on Lifestyle

We have seen in preceding chapters that a number of characteristics of individuals, and the characteristics of neighbourhoods, can lead to a higher level of disability prevalence in some areas. In this chapter the influence of the onset of disability itself on lifestyle and spatial location is discussed. The links between low economic status, low status housing and the disabled are identified, and the likely effect of this on the locational opportunities of people with disabilities are discussed. The chapter goes on to draw together the various causal processes that have been suggested in Chapters 4 and 5 with those presented here, and a conceptual model to explain spatial patterns of disability is put forward.

Employment Opportunities

In a discussion of the role of the elderly in determining spatial patterns of disability, Walker (1983) has suggested that their low status position in society is related to their marginal location in relation to the labour market. Employment may therefore be of prime importance in determining the level of resources available to the disabled, and the lifestyle they enjoy.

The early work experiences of disabled school leavers has been shown by Walker (1982) to be of crucial importance in determining their quality of life over the rest of their working lives. In a study of 18 year old handicapped young people, Walker was able to comment that:

> "...many of the handicapped 18-year-olds seemed destined to grow up disadvantaged and to remain unqualified and untrained. Since it is more or less certain that the predominant structure of opportunity and organisation of employment will not change dramatically in the foreseeable future, handicapped young people will carry out low-skilled jobs at the bottom of the occupational hierarchy."
>
> Walker (1982,pp 178)

When compared with a representative group of non-disabled young people, it was found that 27% of the disabled youngsters had experienced unemployment since leaving school, while in the comparison group had a level of unemployment of 4%. A number of other studies have recognised the disadvantaged position of disabled adults in the labour market. Sainsbury (1968,pp 89), in a study of registered disabled people, found that 2/3 of her sample group of working age were without employment. Buckle (1971,pp 16-17), as part of the Harris national

survey identified an unemployment rate of 54%, and more recently Townsend has reported a rate of 50% (Townsend,1979;pp 1055).

When one examines the type of work taken up by the younger people with a disability they are, according to Walker, five times less likely to be found in jobs of a clerical type. They are much more likely to be found in occupations in the industrial manual sector. Even here however, in the industrial manual sector, young people without disabilities were three times more likely to be in engineering trades, particularily as apprentices than their disabled counterparts.

Townsend (1979,pp 727) has pointed out that descrimination exists against adults with disability in three other areas in addition to their experiencing higher rates of unemployment. Firstly the level of pay obtained by those in employment were lower than for those without disabilities, and becàme progressively lower with increasing level of disability. Even those people with relatively slight levels of disability were at a disadvantage, 45% with minor incapacities earning under 80% of the mean annual wage, compared to 35% of non-disabled people (Table 6.1). Secondly those with a disability had to work longer hours to obtain similar rates of pay to their peers. Thirdly there were significant differences in the working conditions experienced by those workers with a disability, compared with those of non-disabled workers, with relatively fewer disabled people working in "fair" and "good" conditions (Townsend,1979; p 732).

Explanations for this low level of employment opportunity vary. Walker has suggested that informal descrimination may exist in recruitment of young people, especially in the secondary labour market, a market that appears to be most significant for young people with a disability. Good appearance and other visible personal characteristics are important in determining the access a person may have to the job market, and it is in this area that many young people with a disability are at a disadvantage. Walker is not alone in pointing out that more systematic elements of discrimination are operated by employers towards certain forms of disability. Sutherland (1981) provides evidence that employment is made very difficult for those suffering from epilepsy. It is clear that employers follow the normal pattern among the community in perceiving disability in terms of physical disability, and are relatively ignorant of the problems faced by those with mental impairments, and also of their abilities (Weir,1981). These perceptions have an influence on who employers are willing to take on, and on their attitudes to these people at work. This may be a factor in the relatively unstable work histories of many of the young people in Walker's sample.

The Effect of Disability on Education Opportunity

The career of young people with disabilities in education

TABLE 6.1 : Percentages of non-incapacitated and incapacitated men and women, and men and women with and without disabling conditions with gross earnings in previous year as % of the mean (1)

Gross Earnings last year as % of mean	Degree of incapacity			
	Men			Women
	None (0)	Minor (1-2)	Some, appreciable or severe (3+)	None (0)
Under 60	11	11	17	14
60-79	24	34	26	18
80-99	26	26	31	21
100-39	26	22	15	29
140+	13	7	10	18
Total	100	100	100	100

(1) Men and women aged 20 and over and working 1000 or more hours in the year

Source: Townsend (1979, Table 20.21, pp 730)

Table 6.2 : Percentage of people with different degrees of disability living below and above the state's standard of poverty

Net disposable household income last year as % of supplementary benefit scales plus housing cost	Degree of incapacity (score)					
	None (0)	Minor (1-2)	Some (3-4)	Some (5-6)	Appreciable (7-10)	Severe (11+
Under 100	5	11	12	11	11	12
100-39	19	25	29	36	39	46
140-99	36	27	26	24	23	24
200+	41	37	33	29	27	18
Total	100	100	100	100	100	100

Source : Townsend (1979, Table 20.10, pp 712)

is a major influence on their subsequent employment career, and to much more. There has been a move towards asking for increasing qualifications in jobs that at one time would not have required them. This trend has been exacerbated by the pressure on employment in the current economic climate. Those without educational qualifications are from their earliest years disadvantaged in the labour market.

> "This falls particularily hard on immigrant and older workers who lack qualifications, but also effectively discriminates against the pool of failures from the educational system."
>
> Walker (1982,pp 186)

Harris (1971) has shown that 71% of impaired men and 83% of disabled women had no formal qualifications, although she acknowledges that much of this is due to elderly people in the disabled population whose peer group would also have had little educational opportunity. There is an age gradient observed by the survey, with 50% of the disabled population aged 16 to 29 having no qualifications, compared to only about one third for the general population. For those aged 30 to 49 the disparity was larger, 40% of the disabled having no formal qualifications, compared to 30% for the general population. The disparity falls when one reaches the 75 age group, with 49% of the disabled having no qualification, compared to 45% for the general population.

The Effect of Disability on Income Levels

As many of the disabled population are elderly, and that the elderly have already been identified as a group which has a relatively low income status, it is clear that many of the disabled will be of similar status. A number of studies have described the financial situation of people with a disability. Townsend (1979, p 711) has shown that income levels of households were negatively related to the level of incapacity experienced within them. This relationship held true whether one took the incapacity of the most disabled member of the family, the incapacity of the head of the household, or that of the individual disabled person. The percentage of disabled households living above or below the official Supplementary Benefit level (poverty level) are shown in Table 6.2. From this it can be seen that only 5% of non-disabled households are found to be living at below the poverty level, compared to 11% or 12% for each incapacity severity group shown.

While the age distribution of the disabled population will obviously act to reduce the mean level of income for the whole group, Townsend notes that, after controlling for age, significant differences still exist. Nearly three times as many disabled people aged 40 to pensionable age were in household units whose income was at or below the poverty level, than were those

non-disabled people. Even among comparable disabled and non-disabled people of pensionable age, significant differences were to be observed, with 48% of the non-disabled living at or below the poverty level, compared to 65% of those with some incapacity, and 73% of those with appreciable or severe incapacities.

A primary reason for low income is the high rate of unemployment already referred to, and the generally lower rates of pay obtained by those in employment. For the remainder there are the resources made available by the state in the form of Supplementary or other welfare benefits. Townsend's findings have been confirmed (Supplementary Benefit Commission,1976), the Commission noting that in 1975 between 31% and 38% of permanently disabled adults below pensionable age lived in families with an income at or below long-term Supplementary Benefit levels. Of those disabled people living on state funded benefits, few supplemented it by the amounts allowed in the regulations, 82% having no additional to these payments (SSRC,1981). The wider aspects of family wealth were also influenced by the onset of disability. Sainsbury (1968) noted in her survey that only 20% of her sample had more than £100 saving. Townsend (1979,pp 713) constructs an index of "income net worth" in which disposable income is added to assets. This is shown in Table 6.3 and demonstrates that significantly more disabled people have low income and assets, than do those without disabilities.

Finally the disabled are likely to incur increased financial out-goings related to their difficulties than are those with no disability. Harris (1971) has shown that one in three disabled people claim to have additional costs of living associated with their disability. She gives the examples of additional costs due to higher laundry bills, additional heating costs, special dietary requirements, higher travel costs due to the inaccessibility of cheap public transport, and abnormal wear and tear on specific garments, such as shoes. Her findings have been confirmed by other researchers in respect of people with specific disabilities (Reid,1975; Bradshaw,1975; Baldwin,1977; Loach and Ashley,1976). Harris goes on to show a comparison of income and requirements, and that in 22.6% of cases the income was less than that required. This rose to 38.0% for those who were receiving Supplementary Benefit.

6.2 The Effect of Disability on Spatial Location

The low income status of the disabled leads to associations with particular housing forms, and it is through these associations that patterning can come about. Sainsbury (1968) found that the proportion of local authority tenants was twice as high in her sample as that found in the general population. The Harris survey did not confirm this finding however, revealing that 24% were living in local authority accomodation, and showing instead that significantly fewer disabled people

Table 6.3: Percentage of people of different age and degrees of incapacity in units whose income net worth[a] was below or only marginally above the state's standard of poverty[b]

Age	Degree of Incapacity (Score)			
	None (0)	Minor (1-2)	Some (3-6)	Appreciable or Severe (7+)
15 - 39	21	(31)	(44)	c
40 - Pensionable age	9	13	27	43
Pensionable age & over	28	36	35	52
All ages	17	25	33	50

a Annuity value of assets plus actual disposable income in previous year (less any income from savings and property) for income units.

b Supplementary Benefit scale for income units of different size and composition plus actual cost of housing.

c Number below 20

Source : Townsend (1979,Table 20.12; pp 713)

(33%) were to be found in owner occupation (Buckle,1971, Table 57). The relevant figures for owner occupation and local authority rented tenure at the time were 26% to 48% respectively for England and Wales. There were many disabled people to be found at this time living in the private rented sector (22%). Buckle notes that 86% of the rented sector housing occupied by disabled people had been built before 1919. However their situation in respect of the use of hot and cold running water, bath, and inside WC, along with levels of shared access, was not significantly different from the population in general.

Surveys by Sainsbury (1968) and Townsend (1979) do differ from this picture. Sainsbury notes that the proportion of households in her sample without the sole use of the three basic ameneities was higher than for those in the general population. The main problem was among those living in private rented accomodation. One third of those unsuitably housed had applied for rehousing by the local authority, and Sainsbury was able to say:

> "It is clear that the long term housing needs of the majority of the disabled population were more likely to be met through the local authority than the private sector: most of those interviewed came from the low income groups."
>
> Sainsbury (1971, p 107)

The lack of ameneity is confirmed again by Townsend (1979) who shows that 26% of those people with appreciable or severe incapacities did not have full exclusive use of the four basic ameneities (indoor WC, sink with tap, bath, and cooker). With the shrinkage in the private rented sector since the late 1960's it seems clear that the local authority sector would have taken the lion's share of any redistribution of the disabled. Lowther et al (1973) in a study of Exeter and Edinburgh found occupation rates of 42% and 31.4% for owner occupation in the two sites respectively. This may be compared with figures of 57.1% and 47.3% in the general population of these areas.

There is an implication that a shift may have taken place, with the collapse of the private rented sector nationally. The disabled now appear to be found more frequently in the local authority sector. This is not surprising as much of the research on the private housing sector would suggest that, as a relatively poor group, the disabled would find it difficult to obtain a mortgage (Short,1978; Williams,1976; Boddy,1976). As far as entry into the public housing sector, ill health does play a significant part in the allocation of council housing. A number of researchers have noted ill-health as a reason for joining council housing waiting lists, and disabled people may therefore, a claim to priority in allocations of council house places (Phillips and Williams,1982,p 311; Gray,1976, p 41; Bird,1976,Table III, p 24).

That a shift has occurred on the part of the disabled into the local authority sector is supported by a number of more recent surveys of the disabled. A local authority survey carried out in Strathclyde Region of Scotland found that 78% of the disabled identified were living in district council accomodation or housing association property, and only 22% in owner occupancy (Woldman, Wilson and Gray 1981). Outset (1980) have found a level of 58% of disabled people in North Tyneside living in council rented accomodation, and a figure of 70% in a survey of Belfast (Outset,1982a,b,c). The conclusion is that disabled people may be found, depending on the area, in quite high proportions living in local authority housing.

The evidence from the early 1970's is that levels of amenity experienced by the disabled may be lower than might be expected for their peers. Evidence from the studies of the elderly presented in Chapter 5 support this assertion, with the elderly generally being found in older, increasingly run down housing in the owner occupied sector. With the elderly making up some 50%-60% of the disabled population we may expect their general situation to be representative of that of the disabled.

Evidence of direct relationships between prevalence of disability and low amenity or poverty characteristics of areas come from two American studies. Using correlation and regression techniques, Massey (1980) was able to identify positive relationships between the level of the "Neady Elderly and Disabled" and a number of low status economic variables. These included low median income, relatively low level housing costs, and associations with physical characteristics, such as multi-family occupation of housing, high levels of crowding per household, and generally older housing stock. Further evidence comes from Hugg (1979) who used information from the 1976 Survey of Income and Education to explore the relationship between work disability and poverty status. His analysis was carried out at State level, and identified significant associations between numbers of children living in poor families in each State and numbers of people limited in working because of chronic ill-health (aged 14-64), using comparison of mapped prevalences.

We may, therefore, hypothesise that through the operation of low income, local authority eligibility criteria, and those factors that influence the elderly, the disabled may be found disproportionately in the council rented sector, and the private sector where it exists. Where these sectors are spatially segregated we may expect some influence to be carried into the spatial patterns of disability in the study area.

6.3 A Conceptual Model to Explain Patterns of Handicap

This Chapter has completed the review of factors that may be influential in the development of patterns of disability and handicap. From the information presented here and in Chapter 4 and 5, it is possible to produce a three factor model to explain the processes by which, ultimately, patterns of disability and handicap are produced. The model recognises the multiple level nature of handicap, and points to the places in the development of patterns in handicap prevalence at which the three different factors play their part. The factors may be termed "Generative Factors", "Intervention Factors", and "Redistributional Factors", and these relate to the levels of disease, impairment, disability and handicap. Figure 6.1 provides a schematic representation of how these factors may be influential at each level, increasing the overall prevalence of disability and handicap in particular areas. The next sections go on to explain how these three factors have been derived from the literature previously cited.

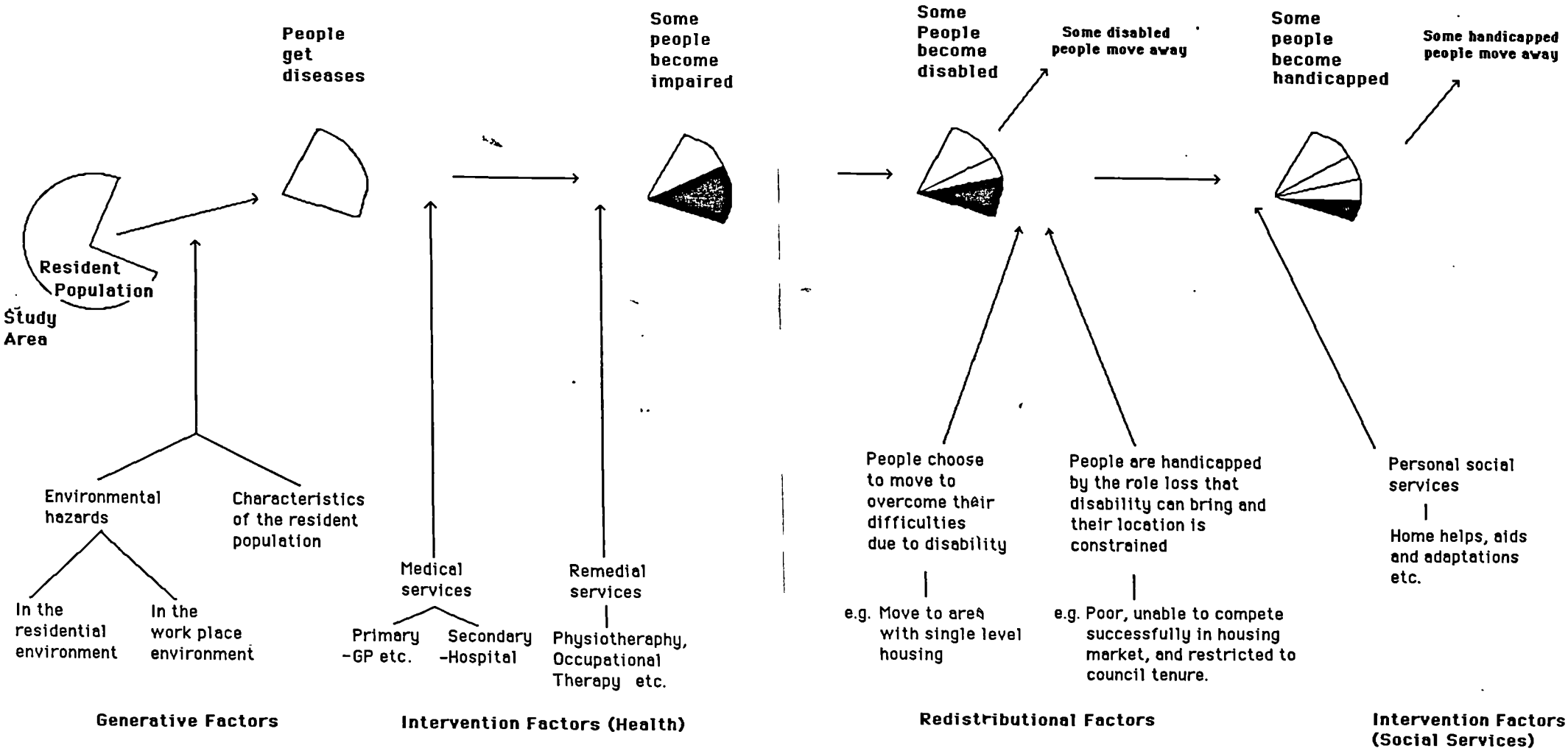
In order to test the relative importance of each of these three factors, and the sub-processes within them, one needs to test their effect in a real situation and with real data. Before these relative effects can be identified, the factors need to be re-formed into a set of testable hypotheses. A series of such hypotheses are developed throughout the rest of the Chapter.

Generative Factors

The model proposed in Figure 6.1 identifies a set of "Generative Factors" operating at the level of disease that may create the first stages of a higher level of disability in any area. These may themselves be sub-divided into a further three groups of factors; environmental hazards in the residential environments; environmental hazards in the work place; and the characteristics of the resident populations. Chapter 4 dealt with environmental factors, and presented information on the relationship between natural environment, man-made environment, social environment and levels of disabling disease. The conclusion drawn was that the natural environment may be a significant factor in creating localised high levels of disability in western societies.

The role of the man-made environment was of more direct relevance in the creation of spatial differences in levels of disability of any magnitude. The two places in which processes may operate are in the residential environment, and in the work place. In relation to residential environments, the most obvious causative factors are the effects of air pollution from industrial processes which may effect local residential areas. Great changes have been brought about over the last 20 years with the introduction of Acts of Parliament to restrict the use of smoke-producing domestic coal, and restriction of industrial emission rates. However, in respect of the

Figure 6.1 : Factors influencing the level of handicap in an area



disabled population, many of who are over the age of 65, the influence of air pollution may well remain a relevant factor in the cause of their chest disorders.

A more complex set of influences may be linked to the quality of the home environment itself. Overcrowding, and damp may increase the likelihood of chest disorders that, if continually aggrevated may result in permanent damage and subsequent impairment. In Chapter 5.6, the work of the Black Commission on inequalities in health was referred to, and attention drawn to the fact that accidents were a major source of impairment among children and young children. Associations were made between poverty and the ability to afford safe heating (paraffin fires are more dangerous than central heating), the lack of areas in which children can be safely supervised in play, and lack of access to phones or private transport in an emergency. All of these may contribute to high levels of impairment in areas that have poor environmental conditions. The complexity comes from the relationship between the level of hazard experienced in these areas, and their social structure. As very little data is available on the detailed situation of particular residential areas in relation to hazards, such interactions may only be identifiable by looking at patterns of poverty and occupational class. Hypotheses relating to these influences are, therefore, contained in hypotheses relating to te influence of personal characteristics.

As we have seen in Chapter 4 many hazardous materials are used in the workplace, and hazardous processes adopted. Once again legislation over many years and factory inspection has reduced the impact of these on levels of disability. However, there remain industries in which the danger of physical accident and subsequent impairment is inherently greater than in, for example, desk work. The mining industry, heavy engineering, shipbuilding, steel making, may all leave their mark on workers in many diverse ways. These may range from deafness for older workers in the shipbuilding industry, and in the mining industry, to the contraction of cancer among those in the leather tanning industry. The influence on spatial pattern is of course more significant where whole communities work in one or more industries with high risks of impairment, the higher risk in industry being translated into high prevalences in residential areas associated with them. Again where information on detailed hazards being faced in the industries of particular areas, one may have to rely on the occupational structure of residential areas. A hypothesis may be formed to cover this generative factor:

> HYPOTHESIS ONE- "The prevalence of disability will be high in areas with a relatively large proportion of their residents working in industries which are intrinsically more hazardous than others".

A second set of generative factors are seen to be the characteristics of those people who are resident in any

given area, and the influence these characteristics have on their probability of contracting a disabling disease. Chapter 5 identified three characteristics which were of relevance to that probability of disabling disease, and therefore, of relevance to the generation of patterns of disability. These were the distribution of the elderly population (usually taken to be those people above statutory retirement age), the distribution of those of skilled and unskilled manual occupations, and possible specific genetic factors effecting specific ethnic groups.

In the first of these, the literature presented in Chapter 3 on the nature of the disabled population, highlighted the fact that, nationally, some 65% of the disabled population were aged 65 or over. The relationship is directly related to the aetiology of many of the most common disabling diseases and disorders which singles out those of advancing years. In many cases the wear and tear involved in many years of active life can itself lead to mechanical degeneration of body and to disability. The state of disability is however, by no means the most common one for elderly people, and elderly people with disabilities are quite rightly included as part of the disabled population generally. In this Chapter we have seen that the elderly have much in common with younger disabled people due to the marginal position they share in relation to the economic structure we live within, and to the descrimination they suffer as a result.

Spatial concentrations of elderly people can and have been identified at many spatial scales as we have seen in Chapter 5. These concentrations may be of elderly people of both high social class, and low social class, and the processes involved in concentration has been categorised into "unplanned" and "planned" explanations by Golant (1975). Unplanned situations, as we have seen in Chapter 5, are those where concentrations of elderly people occur through the operation of social and economic processes. Planned concentrations are formed where special residential schemes that cater exclusively for the elderly are located in an area and significantly effect the age profile of the area. Planned residential schemes can involve severely physically disabled people, and mentally handicapped people as well as elderly people, and this factor is taken into account under redistributional factors.

In unplanned situations the development of housing that attracts a population which is of a similar age group, and ageing "in situ" may lead to large concentrations of elderly people at a later date. Elderly people may often be associated with areas of older owner occupied housing, and often in areas in transition to multiple occupancy flats to accommodate families in earlier stages of the family life cycle. They may also be associated with council housing tenures, often in older housing estates that provided housing for many of similar ages after the collapse of the private rented sector in previous years.

Generally low incomes levels among many elderly people, and especially disabled elderly people, are restricted in their ability to relocate and are often trapped in areas of stable or even increasing concentration of the elderly. One may therefore, form one hypothesis to cover the effect of unplanned concentrations of the elderly on patterns of disability:

> HYPOTHESIS TWO- "The prevalence of disability will be high in areas having a relatively large proportion of their residents aged over 64."

Evidence was also presented to show that, nationally at least, polarisation existed in terms of the social class of elderly people, and their housing tenure. The vast majority of elderly owner occupiers were of managerial and professional occupational backgrounds. This partially adds a second dimension and forms a link to the role of occupational class in the generation of high rates of disabling disease.

It was pointed out in Chapter 5 that significant differences could be identified between groups of high and low status occupational groups, in prevalence of mortality, morbidity and specifically in terms of disabling disease and disability. Reference was made to the fact that manual occupational class was merely a surrogate measure for a whole host of negative social experiences. Lower occupational status could represent higher risk of disablement through a lack of material resources, and therefore poor quality and unsafe homes, polluted residential locations, and selective inability to respond to accidents or illness. In addition, nutritional deprivation, and a lack of ability to make best use of health information or services either through education or motivation have all been linked to the global situation of "manual occupational class". In old age the accumulation of a lifetime of higher risk factors and a systematic lowering of income, especially to those without occupationally derived pensions, all contribute to an additional burden of disability on elderly people from manual occupations.

In any model of spatial determinants of disabling disease and disability, the distributions of occupational classes will be of direct relevance as a "generative factor". An hypothesis may be formed to cover the influence of occupational class on patterns of disability :

HYPOTHESIS THREE- "The prevalence of disability will be high in areas having a relatively large proportion of their residents in semi and unskilled manual occupations".

A number of specific relationships were found in Chapter 5 between certain ethnic groups and disabling diseases such as Diabetes and Sickle-Cell Anemia or Spina Bifida. Where these groups can be identified living in spatial clusters, there is the potential for relatively high rates to be found of a small set disabling diseases. It

is unlikely that disorders of these types will have more than a localised influence on patterns. To take account of this the following hypothesis may be formed:

HYPOTHESIS FOUR- "The prevalence of particular disabling diseases will be high in areas having a relatively large proportion of their residents in ethnic minority groups".

Finally, we return to the role of the natural environment in generating patterns. While previous studies of natural environmental influences have related in the main to infective diseases, some agents in the natural environment have been linked to disorders that relate to long-term disability. These disorders include encephalitis, some cancers. In Chapter 2 we have seen that the diseases that create the largest numbers of disabled people are Arthritis, diseases of the bones and organs of movement, and diseases of the circulatory system. The diseases which have been linked to natural environmental hazards are of less significance in determining the overall size, and therefore the pattern of disability. It seems likely that where any natural environmental hazards do exist, their impacts will influence only patterns of particular diseases, and may therefore be crucial in determining very local maxima in disability prevalence rates. All is not known about the causal roots of many common diseases however, and in any such study some attention still needs to be focused on the potential influence of the natural environment on levels of disability in western countries, and they may be crucial if models are applied in less developed countries. One may form an hypothesis to cover the role of the natural environments in the west:

> HYPOTHESIS FIVE- "Where high rates of prevalence remain unexplained by other factors, these will be related to high rates of particular disabling diseases with natural environment aetiologies".

As we can see from Figure 6.1, the generative factors have their main influences at the level of disabling disease, ultimately helping to create patterns of disability through generating higher levels of disease in some areas. These basic patterns may be modified by the unequal operation of "intervention factors", or consolidated through the operation of "redistributional factors". It is to the latter we now turn our attention.

Redistributive Factors

As we can see from Figure 6.1 there are potentially two sets of redistributive factors. The first operates at the level of disability and involves a choice on behalf of the individual person with a disability. The second operates at the level of handicap, and involves the constraints that emerge from the interaction between an individual's disability and the society in which he or she lives.

In the first set relating to choice, people with disabilities may be prepared to move, if they have the resources, in an attempt to reduce the impact of that disability on their daily lives. Selective in-migration for this reason may artificially inflate the level of disability in an area, over and above that expected from it's base population structure. While little direct evidence exists on the migration characteristics of people with disabilities, some clues may be gained from the evidence presented in Chapters 4 and 5.

Massey (1980) has provided some evidence from his studies of the Neady Elderly and Disabled(NEAD) population in the United States to support the suggestion that accessibility to certain services may be of significance in determining their location. He points out that anything up to a half of the net "income" of the NEAD population comes in the form of direct service provision. In the United States context, the siting of such services has been linked to locations in the centres of urban areas. The relative inadequacy of cheap public transport to suit such groups may mean that a central location is optimal for these groups, if they are to maximise their global "income", and improve their quality of life.

Onset of disability can lead to the house one has always lived in becoming more of a prison than a home. This is due to the normal housing designs that provide bedrooms, bathrooms, and toilets up-stairs. Without the ability to adapt the house, relocation to areas where the ordinary housing is more suitable for those with reduced mobility may be an option. This may mean choosing to relocate in an area where there are bungalows or flats with lift access. Earlier in this Chapter it has been suggested that elderly people have great difficulty in relocating in later life, due to the general age of the properties they own, and their relative financial position, and that non-elderly disabled people may face similar financial constraints. Housing design may not, therefore, be expected to be a powerful influence on overall patterns of disability.

Where current housing arrangements prove limiting with onset of disability, another option may be relocation to a private residential hotel, to a sheltered housing unit, or more commonly a small private residential home. Here independence may be maintained at a certain level, and the quality of a person's life enhanced through the provision of a set of simple basic services on site, or there being a suitable adapted environment, such as lifts, or ground floor flats. Government policy in Great Britain in the 1980's has been to make generous allowances for maintaining elderly people and other dependent groups in private residential homes. As pointed out in Chapter 5, this has led to a blossoming private residential sector, and an opening up of locational choice to many dependent people whose financial position would not normally afford them such freedom of choice. Golant (1975) has been cited in Chapter 5 as identifying

this sort of special residential scheme as a factor in creating local concentrations of elderly people and has termed these "planned or quasi-planned concentrations". The elderly have already been identified as making up the majority of the disabled population in this country. In these planned situations artificial concentrations may result from residential developments that cater for many elderly people, these often being located near relevant amenities, such as the seaside. At smaller spatial scales specific private and public housing developments for elderly people may act as focal points for the elderly disabled within areas that may have younger natural populations and artificially raise local prevalences of disability.

Special residential facilities catering for well defined disabled groups other than the elderly do help to form concentrations of disabled people in the community. While local authority hostels for the physically disabled and the mentally handicapped would usually be excluded from figures on community prevalence rates, being regarded as institutional populations, other less well defined residential schemes exist. The move to community care has involved for many mentally handicapped people a move to group living in ordinary housing. In recent years many small scale private residential homes or lodgings catering for mentally handicapped people have been set up, often in larger ordinary houses that have been converted. These would normally be counted in surveys of prevalence of disability in the community potentially creating higher levels of disability locally, and thereby creating spatial patterning.

In summary, it is unlikely that movement by choice within the owner occupied sector to areas with "mobility standard" housing will have a major effect of patterns of disability given the locational constraints on those involved. The difficulties of relocation may also restrict the ability of people to move towards areas which have better levels of service to help them with the difficulties they face due to disability. It is suggested that small special residential schemes are likely to be much more influential in bringing young and old people with disabilities into particular areas, and thereby influencing local patterns of disability prevalence. The following hypothesis is formed to reflect this situation:

> HYPOTHESIS SIX- "The prevalence of disability will be high in areas where there are located special residential facilities that may attract people with a high risk of disability, such as sheltered housing for the elderly, or small private homes for the elderly, mentally handicapped, or disabled".

The evidence presented earlier in this Chapter has suggested that "constraining" redistributive factors relating to the level of handicap people experience are also potentially very significant in structuring the spatial patterns of disability. The loss of role that disability may bring in key areas such as employment, or

educational attainment subsequently lead to relative poverty, and to the restricted locational choice that may leave for the disabled person. The restriction comes not from the direct relationship between a persons difficulties and their environment, where a disabled person may have difficulty in getting around in unsuitable housing or using public transport. It comes in this case from the fact that many disabled people are handicapped in their ability to work, and as a result are poor. It is their relative poverty that may lead them to be constrained to seek housing in only certain parts of the housing market, thereby severely restricting their locational choice. They are, as a result, more likely to be found in council housing than in owner-occupation. It has already been pointed out that, where disabled people are in owner occupation, they are more likely to be in areas of older housing and lower amenity Many factorial ecologies in this country have shown that residential tenure and levels of residential amenity are unevenly distributed through space. These facts provide another important clue to why patterns exist among people with disabilities. In summary, there is evidence to suggest that the economic and social forces that structure all our lives have the same impact on the disabled. These will tend to concentrate people with disabilities disproportionately into areas with higher levels of council housing and with housing of lower amenity :

HYPOTHESIS SEVEN- "The prevalence of disability will be high in areas having a large proportion of their residents in the council rented sector".

HYPOTHESIS EIGHT- "The prevalence of disability will be high in areas having a large proportion of their residents in housing of low amenity (i.e. at high residential densities, with shared or missing bath and inside W.C.s)".

Intervention Factors

Having seen in Figure 6.1 the potential influences on levels of disabling disease, we now turn to the factors that can influence that basic pattern of disease to create the ultimate patterns of disability observed. These we have termed intervention factors, and they involve a range of services that may be on offer to people in different areas to combate the disabling disease, or to reduce the difficulty the disease causes to people in their everyday lives. These services in the first instances may be direct medical services used to treat disorders and perhaps effect cures, thereby ensuring no impairment or disability arise. These may involve both the primary health sector (General Practitioners and local clinics), or the secondary health sector (Hospitals and the services of medical specialists). If these medical services cannot cure the patient, paramedical services may help reduce the effects of the disease on the individual's functional ability. Where these are successful no real disability might result. It is only in some cases where medical help or

rehabilitation fail, or are of only limited success, that the state of disability may be reached. We must remember that there are many people who are blind in one eye, have a hand which cannot be used, are partially deaf, or even who have an unnatural gait, who suffer no limitation in carrying out the daily tasks of life we all take for granted. These people are not disabled unless they have difficulty in these everyday tasks because of their impairment.

The distribution of medical services, their quality and technical sophistication may vary from health authority to health authority, and within health authorities at broad spatial scales. At the primary health care level, surgeries in areas with concentrations of "at risk" groups of many kinds may have high doctor : patient ratios. This may lead to reduced time for consultations, longer waiting times, all of which may effectively reduce the access of local patients have to necessary health care. The follow-up by community staff after hospitalisation or periods of ill-health may also be reduced in time or effectiveness in such situation. Reference has been made in Chapter 5 to the relative discrimination suffered by those of manual occupational class. This happens either through the relatively poor level and quality of health facilities they have access to, or through their inability to make best use of the services that are offered. The effects of both quality and quantity of health services can therefore, be transferred into spatial differences in health experiences. The relationship is obviously complex, as the level of service provided over many years, may be of relevance, especially in areas where concentrations of elderly disabled people have developed through stable in situ ageing.

The provision of personal social services, through the action of Social Services Departments in Local Authorities, is one of the major state investments in supporting disabled people, and in reducing the handicaps as a result. It will be remembered that handicap is the role loss suffered by someone whose disabilities (difficulty with daily tasks) are serious enough to effect major areas of their independence, such as their role as parent, worker, spouse etc. While much of the support for such people is provided informally by family and friends, or through the use of personal financial resources, it is at this level of difficulty that many of the statutory services are targetted. The provision of home helps, personal aids for daily living, housing adaptation (through the Housing Department), communication aids, advice, and welfare benefits (through central government) all have influences which can maintain independence and role.

In this study a conscious decision has been made to give more weight to the influence of the level of availability of personal social services. This is because information has been more readily available to the researcher, and the level of such services can be seen to have be having

a direct impact on the experience of handicap of people at the time of observation. The services are of a type in which their lack of availability can be related directly to the ultimate level of handicaps suffered by the individual now. Where health services are concerned, the history of their involvement with the individuals making up the disabled population in the area is necessary if one is to determine the extent to which they have contributed to the levels of disability experienced in these areas now. While this set of redistributive factors needs to be included in any explanatory model of spatial patterns of disability, the assessment of their influence is a task outside the scope of this study.

If needs are determined by the latent patterns of disability (and underpinning patterns of impairment and disabling disease), patterns of handicaps may be influenced by the level of response to these needs in any given area. We may construct an hypothesis which seeks a direct relationship between patterns of provision and need.

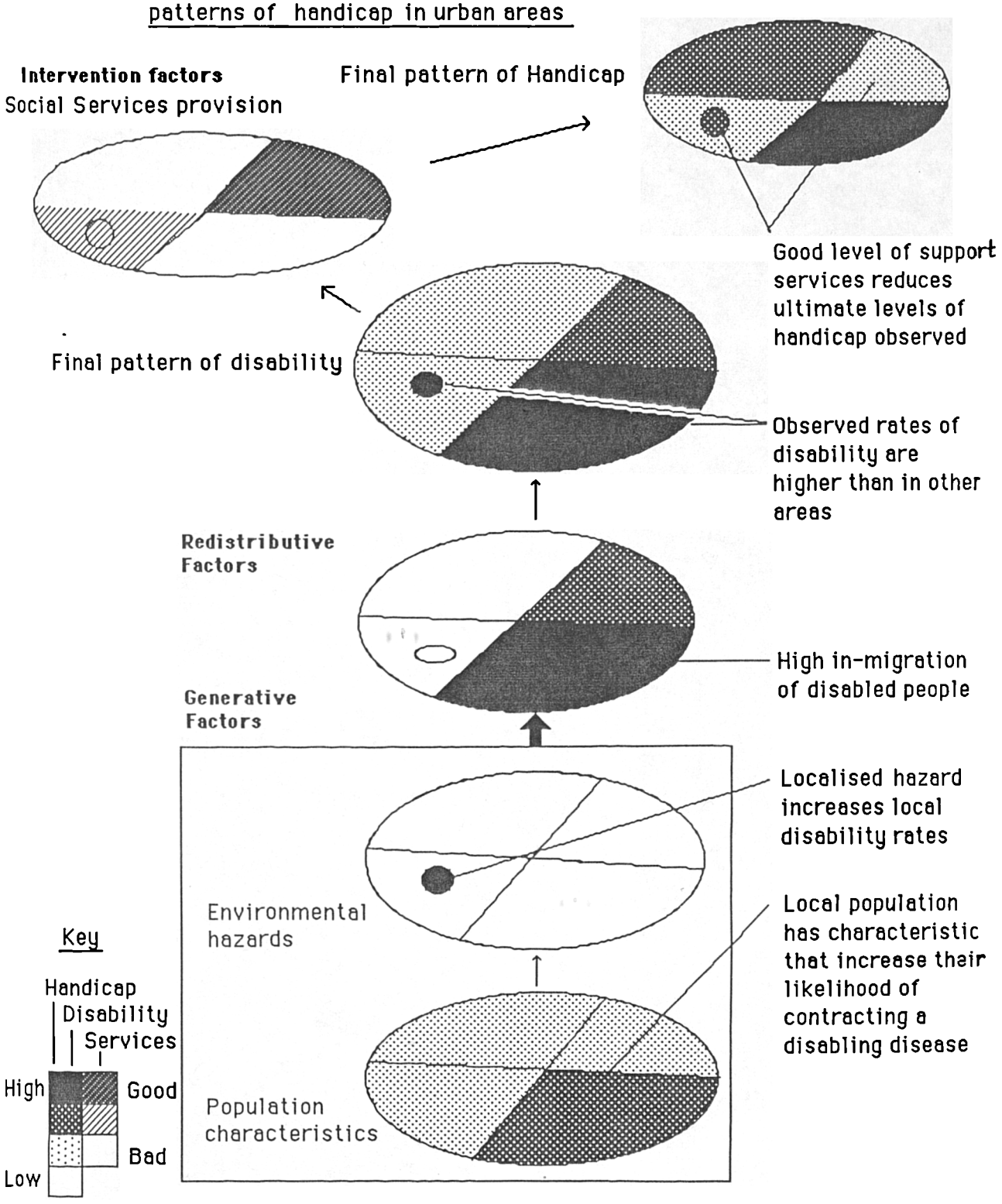
HYPOTHESIS NINE- "Patterns of provision of personal social services will directly reflect patterns of need for these services".

In this research exercise a substantial amount of space is given to the topic in its own Chapter, Chapter 9. Here direct research evidence will be produced on the existence of patterns of handicap that result from the the mismatch between the need for service help and the services response, and on the systematic components of variation in the service provision which define patterns of handicap.

Figure 6.2 is an attempt to bring together the likely effects of the Generative, Redistributive and Intervention factors referred to here on the spatial patterning of disability and handicap across any area. The effects of the processes operating at each level are seen to over-lay one another. The influence of local generative factors lead to a baseline level of disability in each area, that may be inflated by the in-movement of disabled people from other areas due to the characteristics of the host area. The final pattern of disability is modified by the relative availability of services setting out to maintain independence (e.g. Home Help provision, or availability of aids and adaptations). It is possible that two areas with similar levels of disability may find that their disabled residents have very different levels of handicap and quality of life, because service provision is not equitable.

In Chapter 7 the results of a survey are introduced, which forms the basis for testing in Chapters 8 and 9 which of the hypotheses put forward here have any relevance for explaining observed patterns of disability prevalence in a London Borough.

Figure 6.2: Conceptual model of the creation of patterns of handicap in urban areas



III THE GEOGRAPHY OF DISABILITY AND HANDICAP IN A LONDON BOROUGH

CHAPTER 7

DISABILITY AND HANDICAP IN A LONDON BOROUGH

7.1 Introduction

In preceding chapters evidence has been presented to support the view that the geography of handicap is based on a system of complex processes operating at three inter-related levels. At the first level there are a set of factors ("generative factors") influencing the onset of disabling disease that result in some members of society being more prone to disability than others. At the aggregate scale the geography of populations with these characteristics is important in understanding related petterns of disability. At the second level the situation people with disabilities find themselves in within society, leads to their experiencing a reduced set of locational options. These factors ("redistributional factors") are again of importance in understanding why patterns exist in the disabled population. Thirdly, society's response to the problems faced by those experiencing disabilities can have a marked influence over their quality of life or the degree of handicap they experience as a consequence of disability. The systematic elements of society's response comes largely through statutory support services, provision of which has been shown in Chapter 3 to be spatially patterned, not necessarily in accordance with levels of assessed need for these services. Issues of territorial justice arise as a result.

Studies within the field of medical and social geography have been restricted in the levels of the health system they have looked at. We have seen from Chapters 4 and 5 that studies have been concerned with describing patterns of disease, the physical and social ecologies of disease, and aspects of social justice in the geography of service responses to ill-health. The latter have been mainly confined to health services responses as opposed to more general social support services. The higher order problem of understanding the experience of living with the consequences of disease, and how it is affected by patterns of service provision and other social processes, has largely remained untackled. This is inspite of a large scale investment of national expenditure on service directed at "caring" for people with disabilities in our communities.

There are of course many reasons for this lack of attention to the wider perspective. Conceptualisation of the problem, and the interest of researchers has only relatively recently turned to the examination of "quality of life" issues. In addition, the type of study required to look at these wider issues requires the researcher to move away from the more easily available sources of data, such as centrally collected mortality statistics. Data collection on these sorts of issues for a representative number of individuals involves a great deal of time and resources which have not been readily

available to researchers.

In this study however, a survey method has been adopted which sought to contact the vast majority of people suffering from significant disabilities in a London Borough. This provides an opportunity to look at the disabling diseases people suffer, through the implications of these diseases for the daily life of individuals, and at service responses to the problems that they face. For all three levels of information, data is available at polling district scale, and it is hoped that a contribution can be made using this data to an understanding of how patterns of handicap are generated. The remainder of the thesis is organised in four chapters. The current chapter presents the results of the survey by way of description of the disabled population in Barnet. Chapter 8 goes on to look at the possible relationships between patterns of disability in Barnet and the operation of "generative" and "redistributive" factors put forward in Chapter 6. Chapter 9 looks at the patterns of handicap that result from the interaction of the need for help and provision of basic support services to those suffering from disabilities. Chapter 10 then provides a summary of the findings of the thesis, comments on their significance for the social and medical geography and social welfare policy, and discusses future research directions.

7.2 The London Borough of Barnet and its Development

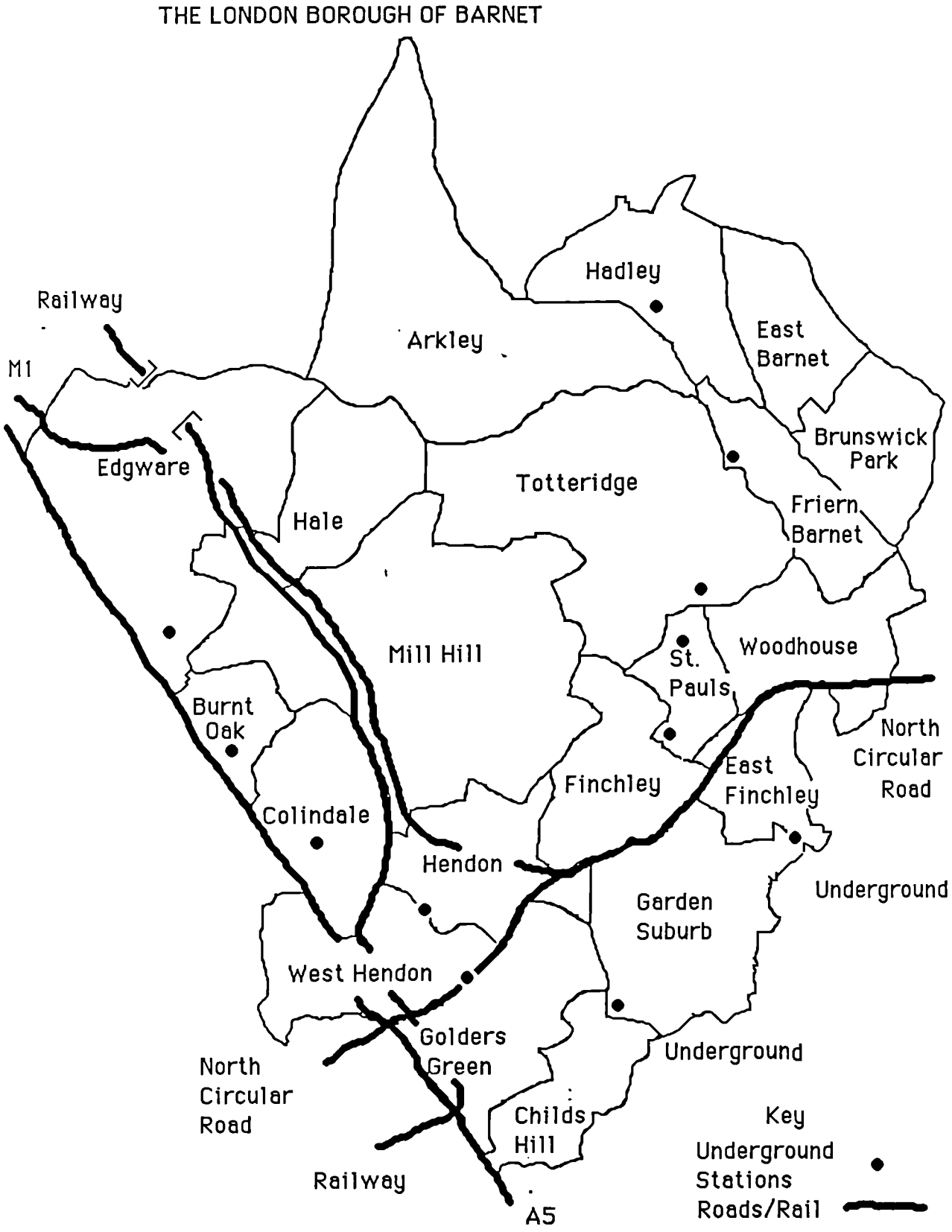
This chapter goes on to describe the social and demographic structure of the Borough with an historical view of relevant aspects of its development. This provides an important context for subsequent analysis of observed spatial patterns of disability.

Map 7.1 shows the location of Barnet within Greater London and Map 7.2 the position of wards and communication routes within it. At its nearest point it is situated some 6 miles from the Centre of London and its northern boundry forms part of the external boundary of the Greater London Area. Barnet is bounded by five other Boroughs and has a strong triangular shape, within which are found a diversity of social groups, and urban forms. In respect of urban density, a gradient exists, with highly built-up residential areas, such as Golders Green and Childs Hill, giving way as one moves north, to less dense residential areas, such as Hale and Arkley. The northern boundary areas form a zone of transition with Elstree and Borehamwood in the Green Belt.

While the Borough as a whole is mainly associated with residential land use, there are many industrial and manufacturing firms operating within the area. The Borough is well served by transport routes to the rest of London and the South of England. Two London

Map 7.1: The location of the London Borough of Barnet within Greater London

Map 7.2 : Ward boundries and major communication routes



Transport Underground routes run through the area in a north/south direction, one to Edgware, the other to Hendon, both elements of the Nothern Line. In addition the North Circular Road cuts across the south of the Borough linking ultimately the south of London with the north. The Borough is well served by major roads including the A5, the A1000 (the Great North Road) and the M1.

The development of the social structure of Barnet has been intimately linked to the development of transport facilities in the Greater London area. To a great extent the fare structure of these different forms of transport has, over the years, influenced the class of people able to use them and, as a result, the locational possibilities open to these classes within Barnet. In the 19th century, it was generally the middle classes who took up the idea of suburbanisation, and this was certainly the case in Barnet. Movements were made into the areas of Barnet nearest to central London by people of these classes, additional waves moving further out much later. Indeed some areas further out such as Edgeware and High Barnet, remained much the same size as they had been in the 16th century until the 1920's.

These early moves by middle class families were in part due to the major links to central London workplaces being by rail. These rail links geared themselves to the needs of first class travellers through their high fare tariffs, and the hours at which they ran. The only other early suburban transport link, the horse bus, was also aimed mainly at the well off middle classes because of the fares charged. Large scale migration of working class families to the suburbs only came with the introduction of relatively cheap horse tram transport, and the development of local, cheap steam train services in 1850's and 1860's (Pollins, 1964). With these horse tram routes came the first relatively low cost housing developments in suburban areas. The class distinction between horse bus and horse tram use were well known, and existing middle class areas fought hard to keep private tram companies from developing routes near them for fear of an influx of the "lower orders" and a subsequent fall in property values. This led to many examples of social polarisation within Barnet, with working class people being attracted to new housing located along the new tram routes.

Steam trains were forced to offer 3rd class travel from 1844 with the Railways Act of that year. While some companies began to offer cheap fares for working people in the 1860's, on the basis that they the companies had knocked down many working class homes to build their railways, it was not until 1883 that the Cheap Train Act forced their hand. After this they had to offer regular early trains for early workers with cheap fares, and this again brought more working class people to the previously middle class dominated Barnet area. An

increased interest in a more integrated approach to housing and transport developed around the turn of the century and was helped along by the increasing intervention of the London County Council (LCC). Recognising the role of tram transport in suburban development, and through this the easing of many central housing problems, the LCC progressively took over private tram ways from 1889 to 1907, extending them and electrifying them as they went. The influence of the local authority on fare structure helped to keep the fares charged by other private tram companies low, and ensured this form of transport had a major role in suburban residential development during the first twenty years of this century.

Along with tram and railway and moves to cheaper fares, the development out into the suburbs of the London Underground, which had originally served central London, had major influences on Barnet as we now see it. By 1907 the central ring, now known as the Circle Line had been extended to Golders Green in the south of Barnet. After the First World War this part of what is now the Northern Line was pushed out to Edgware. Many firms and many working people moved to the Hendon area in the post-First World War period to make the most of the new communications systems. In the time between the Wars the other section of the Northern Line was also completed, taking the line to High Barnet, thereby improving links on the eastern side of the Borough.

The LCC linked a major new housing development to the opening of Burnt Oak station on the Edgware link in 1924. "Watling", as it was called, provided over 4000 houses by the time it was finished in 1929 on a 390 acre site, mainly catering for families from areas closer to the centre of London, such as Islington, St. Pancras and Paddington (Durant, 1939). This firmly established large scale concentrations of lower class families within the Borough. After the Second World War the trend towards these large local authority developments continued and took place within Edgware itself. More recently large estates have been developed in Colindale.

There had, therefore, been early large scale development throughout Barnet by the middle classes in the last century, followed by a smaller migration of working class families during the first 30 years of this century, firmly linked to developments in tram-way and Underground services to the area. Much in-filling has taken place since, of both private and public sector residential development, along with increasing development of light industry, especially linked to the main road routes in the western half of the Borough (A History of Middlesex, p 153).

7.3 The Survey of Disabled People in Barnet

In June 1978 the London Borough of Barnet Social Services Committee commissioned a survey to identify disabled people in the Borough. The aim of this survey went further than fulfilling the Boroughs' obligation under section 1(1) of the Chronically Sick and Disabled Persons Act to :

> "inform themselves of the number of persons to whom that (1) section applies within their area and of the need for the making by the authorities of arrangements under that section for such persons."
>
> (CSDP,1970)

The scope of the survey was to discover the individual variation in difficulties experienced by the handicapped individuals concerned, their need for a wide variety of services, and an expression of their level of satisfaction with the services they already received. The survey was to deal exclusively with private households and not with handicapped people living in hospitals or in local authority specialist homes for the disabled, including elderly persons homes.

The organisation commissioned to carry out the research was a charity called Outset, which had carried out similar surveys in the City of London, Harlow New Town, Central Region of Scotland and Northern Ireland, among other areas. The author was at this time Research Officer with Outset and had major responsibilities in training of interviewers, designing survey methods, and in the analysis of results.

The criteria for inclusion within the Barnet survey were wide. They involved those people suffering long-term disablements and disorders which interfered with their performance in activities essential to that individual's independence, and which might, therefore, create for them difficulties for which they might need special or extra help. The survey was not concerned with cases where impairment did not result in difficulty, and did not therefore provide a total census of disorders experienced.

The methodology involved two stages. In the first stage a 100% household canvas was carried out, by volunteers and teams of workers employed for one year under the Manpower Services Commissions' Special Temporary Employment Programme (S.T.E.P.). The first stage set out to identify households where one or more person lived who experienced difficulty due to a physical or mental impairment, and to obtain permission for a subsequent detailed interview. A recruitment campaign lasting several months brought together a large number of volunteers (many from local disablement groups) who were

to carry out a Borough wide screening exercise. Using the electoral register, hundreds of "walk cards" were drawn up, each containing a number of roads, blocks of flats, and houses to be visited. These were distributed to volunteers, each of whom received detailed written and verbal guidance on how to conduct the screening exercise. The volunteers began work in August 1979, visiting each household in Barnet to find out if there were any people with disabilities living there, and to obtain a subsequent interview with a trained interviewer. For the purposes of the screening exercise, the people the survey was aimed at identifying were defined as :

> "Anyone with a permanent and substantial disability. This not only means people using wheelchairs and crutches, those who have been handicapped from birth, or those who have lost limbs or the use of limbs in accidents. It includes people prevented from leading a full life by chronic disease such as chest or heart trouble, epilepsy, mental handicap, mental illness or nervous disorder and breakdowns. We are also looking for people who are deaf, blind, partially sighted or hard of hearing. If you are housebound, or have difficulty walking, going up and down stairs, kneeling or bending, then we should also like to talk to you about the difficulties you face."
>
> Outset (1981, Appendix 2)

If no contact could be made after the first attempt, 2 subsequent attempts were made by STEP workers, and as a final resort a prepaid reply postcard was left, through which an interview could be obtained. While the bulk of households were contacted prior to Christmas 1979, work on picking up non-reponding households continued until the end of the survey. In all, some 90,000 households were visited during the survey.

Interviewers were employed for one year and received special training in the use of the Agerholm "Handicap Profile" Questionnaire (discussed in detail in Chapter 1). The interviewers were grouped into four teams covering four geographical areas. Their responsibilities included completion of outstanding screening work, carrying out follow-up interviews with those agreeing, and punching the resulting information onto mechanical sort cards. Responsibilities for analysis and quality control were arranged hierachically. Clipped cards and sheets were cross checked at the office of the local survey coordinator, and disabling disorders were classified into seventeen groups, using a system devised by Dr. Margaret Agerholm. These questionnaires and punch cards were then batched and analysed on a weekly basis. Summary sheets were then passed on to Outset centrally for additional cross checking and aggregated to provide a cumulative set of total figures for the whole survey.

The questionnaire used in the survey is shown in full in Appendix 2 . It was used in a self-carbonising form, a copy of information received being left with the respondent. It contained a detachable address slip which enabled the respondent to retain his or her name or address if he or she only wished to give information for planning purposes. This has led to the location of some people being purposefully made unidentifiable. The information contained on the questionnaire consisted of the following range of items :

i Reference number
ii Ward code
iii Date of birth
iv Sex
v Whether living in council housing or not
vi Whether living alone or with others
vii A classifications of mobility
viii Disorders suffered
ix Difficulties experienced (102 items across 11 aspects of daily living)
x Help or equipment required, received or dissatisfied with (121 items)

Fieldwork and analysis on the survey continued until May 1980. In 1981 a report was published which presented the results of a manual aggregation of all the information collected in the survey at local authority level, along with a ward breakdown of prevalence of disability (Outset, 1981). The report noted prevalences ranging from 16 to 60 per 1000 population across wards, with a Borough prevalence of 18 per 1000.

While the main thrust of the report was a global description of the situation for Barnet as a whole, the study did suggest that three things might influence differences in the level of disability within Barnet. Firstly the age structure of an area was seen as influential, the older the population in an area, the more disabled people one might be expected to find. Secondly the social character of an area in terms of the income ranges of those it will attract would be influential, high house prices excluding disabled people because of their intrinsically lower incomes. Thirdly the dominant social class of particular areas, while itself linked to average incomes, might act as a disincentive to mobile disabled people. These themes were developed to help explain why a lower prevalence of disability was recorded for Barnet compared with national prevalence rates taken from Harris (1971). There was an observation made that prevalence in council housing areas and areas with lower-income characteristics, was higher than the average prevalence rate for the Borough as a whole.

These interesting points were not satisfactorily supported by detailed research on the patterns of disability within the Borough and the social-economic

associations that existed. In this study the effects of socio-economic structure, demographic structure and other influences on prevalence of disability are approached from the more stuctured theoretical perspective developed in Chapter 6. More sophisticated statistical techniques and a finer spatial scale are also used to develop some of the suggestions made in the original study.

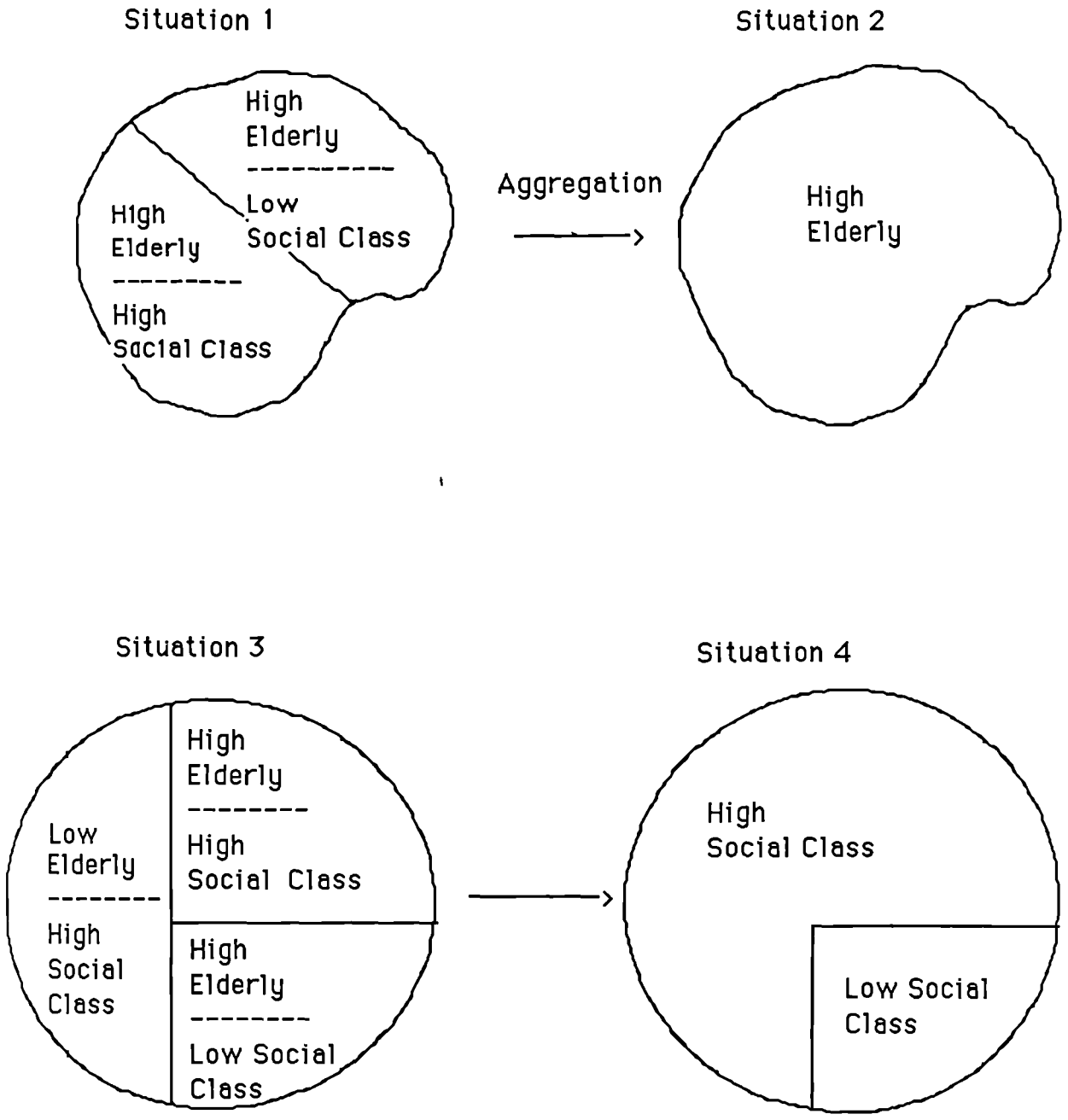
With the permission of Barnet Social Services Department the original questionnaires from the survey were obtained, coded, and transferred by the author onto computer over a twelve month period. In addition to the information on demographic status, mobility, difficulties, and service usage, addresses were mapped to the level of enumeration districts (E.D.'s), and polling districts, as well as the existing ward location. These codings were then included on the computer record for each questionnaire. The original classification of disabling disorders was abandoned, and up to five disabling disorders were coded according to the International Classification of Diseases (Ninth Revision)(W.H.O,1981a) again being included in the computing record for analysis.

7.4 Spatial Units

For the purposes of analysis polling districts were used as the spatial framework for analysis. There were over 630 enumeration districts in Barnet and questionnaires had been coded for E.D. location to enable subsequent aggregation if desired. This led to an average number of disabled persons of 7 per ED. This did not allow for an analysis of disorders by area at an ED level, or any other analysis involving the breakdown of people's characteristics by a dimension, unless an ED aggregation procedure was adopted. Many such procedures rely on the aggregation of small areas based on minimising the "distance" between individual area values, and group mean values as measured on a particular variable (Everritt, 1978). Other approaches involve clustering using scores on a pre-prepared summary index, as in Principal Components Analysis or Factor Analysis (Goddard and Kirby, 1976). In all of these some choice is made on the variable or variables in relation to which aggregation of areas is to be performed, even if this occurs at an early stage, as in Principal Component Analysis.

In this particular study it was ultimately found to be difficult to identify the best variable to use as criteria for collapsing smaller areas into large areas. The ultimate effect of such a procedure would have been to artificially "control" any resulting prevalence patterns by a possibly significant independent variable. An illustration is given in Figure 7.1. If the proportion of elderly in an area were used for

Figure 7.1 : The potential problems of spatial aggregation



aggregation, the spatial pattern shown in situation 1 may be resolved into the grouping shown in situation 2, on minimisation of between group variation. The variation due to class differences is lost in the grouping process. In situation 4 the areas in situation 3 have been aggregated on the basis of class composition, the aggregation masking the influence of age on any subsequently observed pattern of disability.

Given these factors it would become difficult to assess what influence the aggregation criteria was having on the observed distribution. It was therefore, decided to use polling district boundaries for the presentation of prevalence data, with a recognisation that these boundaries were arbitrarily drawn. Polling districts are drawn to reflect estates, are of a scale that may potentially reflect some sense of neighbourhood coherency, and they contain populations large enough for differences in prevalence and levels of disabilities to be assessed for significance.

In 1983, when the locational coding was carried out, there were 100 polling districts making up the Borough of Barnet. In a very few cases 1981 census enumeration districts were not co-terminus with these polling districts and an adjustment was made, a reapportionment of the population of any particular enumeration districts spanning two polling districts being made. This reduced the number of polling districts to 98.

7.5 Limitation of the Survey Methodology

An important feature of the survey methodology was it's self reporting nature. Respondents gave their own perception of their disorders, difficulties and of the help they required as a result, no confirmation being available from GP's, paramedical or social services staff. The problem here is that people may potentially miss-report their disease or disorder, or the level of difficulty they experience as a result. There is however, a tension between large scale survey work and the validity of the responses obtained. This cannot be reconciled unless a massive amount of resources are committed to the exercise. To have a fully professional team to assess all the disabled in a Borough would cost many thousands of pounds, and take considerably longer than the ten months of the Outset survey. In addition, the longer surveys take to complete, the more likely the base population is to change, and therefore for the results of the survey to be out of date. The self-response approach is not unusual therefore, the national survey of 1968 adopting the same procedure (Harris, 1971) and the approach was also a feature of the survey package recommended to all local authorities by the DHSS for carrying out CSDP surveys (DHSS, 1971).

The authors of the report of the Barnet survey suggest that the experience of the results of a disabling

condition as perceived by disabled people, is just as valid a perspective as any other. Other common perspectives are "expressed" or "assessed" difficulty or need, the first being measured by the action of going to the doctor or a service about the disorder, the second measured through assessment by a qualified professional. Both of these other perspectives have subjective elements within them, albeit less obvious at first sight than self reporting.

Aggregate measures of health expressed by a visit to a doctor are influenced by factors other than actual prevalence of illness. As we have seen in Chapter 5, the number, location and facilities offered by GP practices influence peoples ability or wish to travel and use them. The service they offer can be rationed on the basis of considerations other than a total commitment to solving health problems.

Equally the assessment by professionals of people's health status, difficulties and needs are not objective. The assessment of difficulty can be influenced by the life experience of the professional, and by the dominant philosophies of their professional training. Additionally the assessment of what people "need" involves, in many cases, measurement in relation to what is available, or what is a priority for provision by the responsible agency, the assessment being therefore subject to political rather than purely objective criteria. The concept of need will be discussed in more detail in relation to service provision in Chapter 9.

Two further limitations exist, the first being inherent in the methodology adopted by the original survey and is related to the fact that first stage screening of the population was largely carried out by volunteers. While door to door canvassing is comprehensive, the door step approach is more open to vagueness and misinterpretation by the householder than an official approach by an experienced canvasser. A volunteer, confronted by a quizzical respondent, may not adequately present information on who is to be interviewed, or why identification is necessary. To an extent therefore, the level of accuracy of the number of people identified is to an extent dependent on the consistency of approach achieved by volunteers.

A number of steps were taken to minimise the level of variation. Volunteers were asked to deliver a printed information sheet giving details of the survey and what was required, along with a validatory letter from the Social Services Department. They then returned to collect the responses, answering queries at the door. A series of "scripted answers" to common questions were provided on a card for volunteers to obtain some consistency of reply. In addition, younger people were avoided for this exercise, as previous experience had shown that householders were less likely to admit to

having a disabled family member to young people.

The second limitation is one shared by many other surveys, and relates to the nature of the characteristics of non-respondents. The number of people who refused to be interviewed even though identifying themselves as disabled represented 8% of the total disabled population. By definition we do not know if those who refused interview in the survey were different as a group from those who were not interviewed. This may raise doubts on whether the results truly reflect the situation of the disabled population in Barnet as a whole.

The actual effect of different approaches by volunteers, and the nature of non-response remain unquantified. An attempt has been made to validate the survey results by comparing the level and characteristics of the disabled population identified in this study, with that obtained from other surveys. The results of this comparison do not reveal any significant cause for concern. Where non-response is spatially non-randomly distributed however, this could potentially lead to conclusions being drawn from spatial analysis that do not represent the true situation in the Borough. While this problem could not be resolved within the framework of the survey, its implication for particular analyses will be referred to where appropriate in the text.

7.6 The Characteristics of the Disabled Population

In total 4995 people identified themselves as disabled in the survey, but for a number of reasons 424 were not able to be interviewed, representing 8.5% of the total identified. Of 4571 questionnaires completed, 149 were not codeable to a particular polling district due to addresses being removed at the respondents request. Patterns are therefore based on 4422 cases, 88.5% of the total number of disabled people identified in the original survey, while figures for disorders, difficulties and service provision are based on 4571 (91.5%).

Table 7.1 shows how these people were distributed across the wards in Barnet, and demonstrates that those who could not be included in the interviewing stage were evenly distributed across the Borough, the average completed interview rate being 90.1%. The two major exceptions were Woodhouse and West Hendon, the former having an interview rate of only 39.1% of the disabled population, and the latter an interview rate of 77.2%. The effect of this will be mentioned in the interpretation of the analysis.

The significance of spatial patterns of disability

The figure of 4995 people with disabilities represents a prevalence rate for Barnet as a whole of 17.7 per 1000. This is well below the figures of 28.6 per 1000 found by Harris (1971), and subsequently national estimates of disability prevalence (Townsend,1984; Knight and Warren,1978). (A full tabular list of prevalence by polling district is given in Appendix 3, with a polling district map). Figure 7.2 gives the distribution of prevalence of disability across polling districts, while Map 7.3 gives the spatial distribution of prevalence rates. It can be seen from Figure 7.2 that prevalences are slightly positively skewed, 58% of polling districts having prevalences below the mean value for the Borough. The distribution has a median prevalence of 14.4 and an inter-quartile range of 11.7. Prevalences range from 0.0 disabled per 1000 resident population in 1981 to 57.5 per 1000.

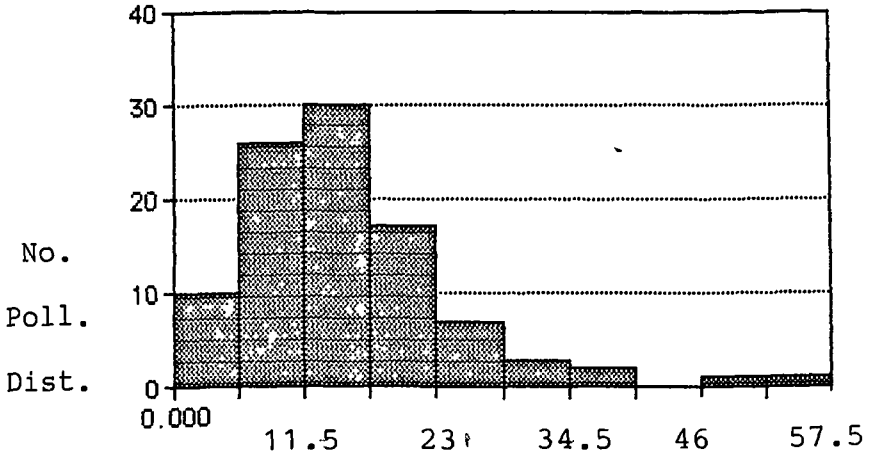
We can see from Map 7.3 that the areas with the highest rates of disability appear to occur in a band on the west of the Borough, and a number of isolated high spots in the north east and east. The central band running north/south through the Borough appears to be generally lower in prevalence rate. The solid band running along side the A5 in the west of the Borough, picks out at its core, high levels of prevalence in the larger council housing estates within Burnt Oak and Colindale. Prevalences of between 30 and 60 per 1000 are also found on the old Jubilee estate in West Hendon, and an area in

Table 7.1 : Number interviewed as a percentage of total disabled in Barnet

Ward	% of disabled interviewed
Finchley	100.0
Hadley	98.9
Colindale	98.7
East Finchley	97.8
Child's Hill	95.7
St. Pauls	95.5
Golders Green	95.2
Edgware	93.3
Hale	94.6
Hendon	94.6
Garden Suburb	93.5
Mill Hill	93.5
Burnt Oak	93.2
Friern Barnet	91.8
Totteridge	90.7
East Barnet	89.8
Arkley	89.2
Brunswick Park	87.2
West Hendon	77.2
Woodhouse	39.1
Barnet	91.5

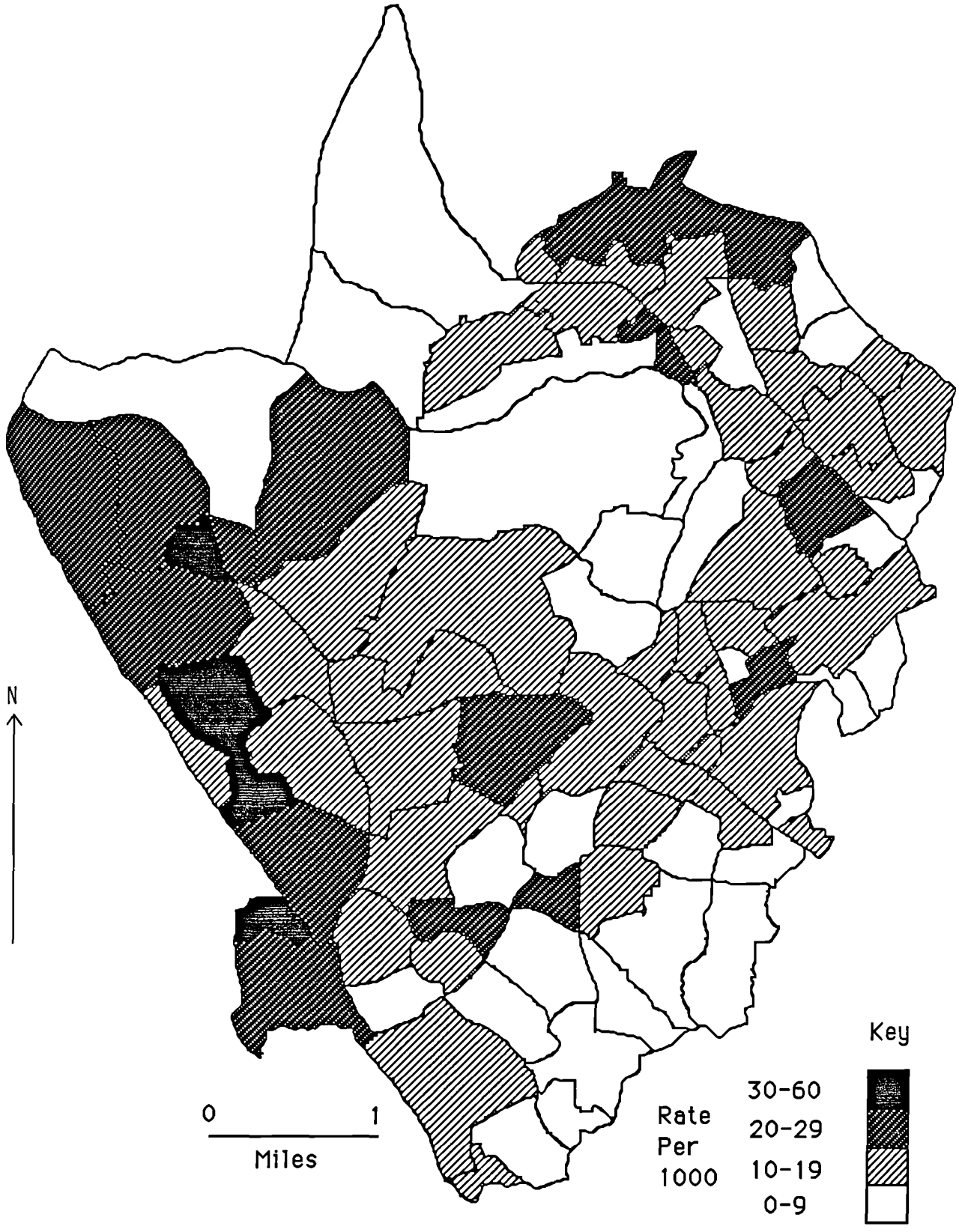
Source : Original Data

Figure 7.2 : Distribution of disability prevalence across Polling Districts in Barnet



Source : Original Data

Map 7.3 : Prevalence of disability



Edgware. To the north east, the areas of Barnet Vale and New Barnet on the border of Barnet, have levels of 20 to 29 per 1000. Other areas with prevalences of 20 to 29 exist in the area surrounding Paddington Cemetary in Mill Hill, an area north of Hendon Park, west of Hendon Central Station, and an area bounded by Finchley Road, and the North Circular Road, both in Hendon.

It is the proposition of this study that there are non-random factors that can produce observed patterns of disability and handicap. While inspection by eye of Map 7.3 would suggest that there is a non-random pattern of prevalence to be explained, there is a need for a more reliable test.

The use of spatial autocorrelation techniques to establish with some level of objectivity the existence of meaningful pattern has been established in a number of contexts. Giggs (1972) has used the technique in his study of schizophrenia in Nottingham, along with the use of probability mapping. Glick (1979) has also used Moran and Geary Statistics, and uses Moran in a more sophisticated analysis examining the relationship between cancer levels in contiguous areas, and for those at increasing distances from sites. Spatial autocorrelation relies on the weights matrix which identifies when two areas within a boundry are contiguous. The weights matrix then constrains the calculations using only those values for areas that are spatially contiguous. The Moran Statistic will increases in size as a larger than expected number of high scoring areas are found together, while the Geary Statistic becomes increasingly negative.

Auto-correlation coefficients for both Moran and Geary were produced for the polling district map of disability prevalence given in Map 7.3 using a spatial contiguity matrix of 1 and 0 weights to represent two areas either touching or not touching. Table 7.2 gives the result of these auto correlations; with values of C and I being presented in terms of standard normal deviates assuming both normality and randomization. If a non-random pattern exists and there is a meaningful pattern to explain, Moran and Geary Statistics would be expected to reach a level in excess of +2 and -2 respectively. Table 7.2 shows that both statistics exceed the one standard deviate by very significant margines, ensuring that subsequent analysis of causal relationships is worthwhile.

Age and Sex

The age and sex characteristics of the disabled population of 4571 interviewed in the survey are shown in Table 7.3 and 7.4. Those people aged over 64 years of

Table 7.2 : Results of Moran and Geary tests for auto-correlation for prevalence of disability

	Actual value	Standard Normal Deviates assuming	
		Randomization	Normality
Moran (I)	0.2826	5.1284 *	4.9946 *
Geary (C)	0.5554	-4.6411	-6.2386 *

* Significant at 99% level.

Source : Original Data

Table 7.3 The age distribution of the disabled population of Barnet compa red with that of Great Britain

Age	Barnet +	%	G.B.*	%
0-15	173	3.7	-	-
16-29	143	3.2	19000	1.7
30-49	317	7.0	97000	8.6
50-64	1406	30.8	281000	24.9
65-74	1422	31.1	349000	30.9
75+	1110	24.3	381000	37.8
Total	4571	-	1128000	-

Table 7.4 The sex distribution of the disabled population of Barnet compared with that of Great Britain

Sex	Barnet ++	%	G.B.*	%
Male	1655	36.2	365000	32.4
Female	2893	63.3	763000	67.6
Unknown	23	0.5	-	-
Total	4571	-	1128000	-

* Source: Harris (1971,table 10,pp 18)
+ Source: Original Data

age made up the majority of the disabled population (55.4%). This distribution is compared with the age distributions found by Harris (1971) and we can see that the distribution of age and sex for disabled people in Barnet is very similar to that found for Britain as a whole. The exception is that there are fewer disabled people aged over 75 found in the Barnet population than in the British disabled population as a whole, and slightly more in the 50 to 64 age group.

This is reflected in the sex distribution of the Barnet disabled population, there being relatively fewer disabled females than in the British disabled population. Women tend to live longer than men and, due to the degenerative diseases associated with ageing, tend to be over-represented in the disabled population. A female elderly population that is proportionately smaller than the national average tends to lead to a proportionate reduction in the number of women associated with the disabled population, and in the size of the disabled population that is aged over 75.

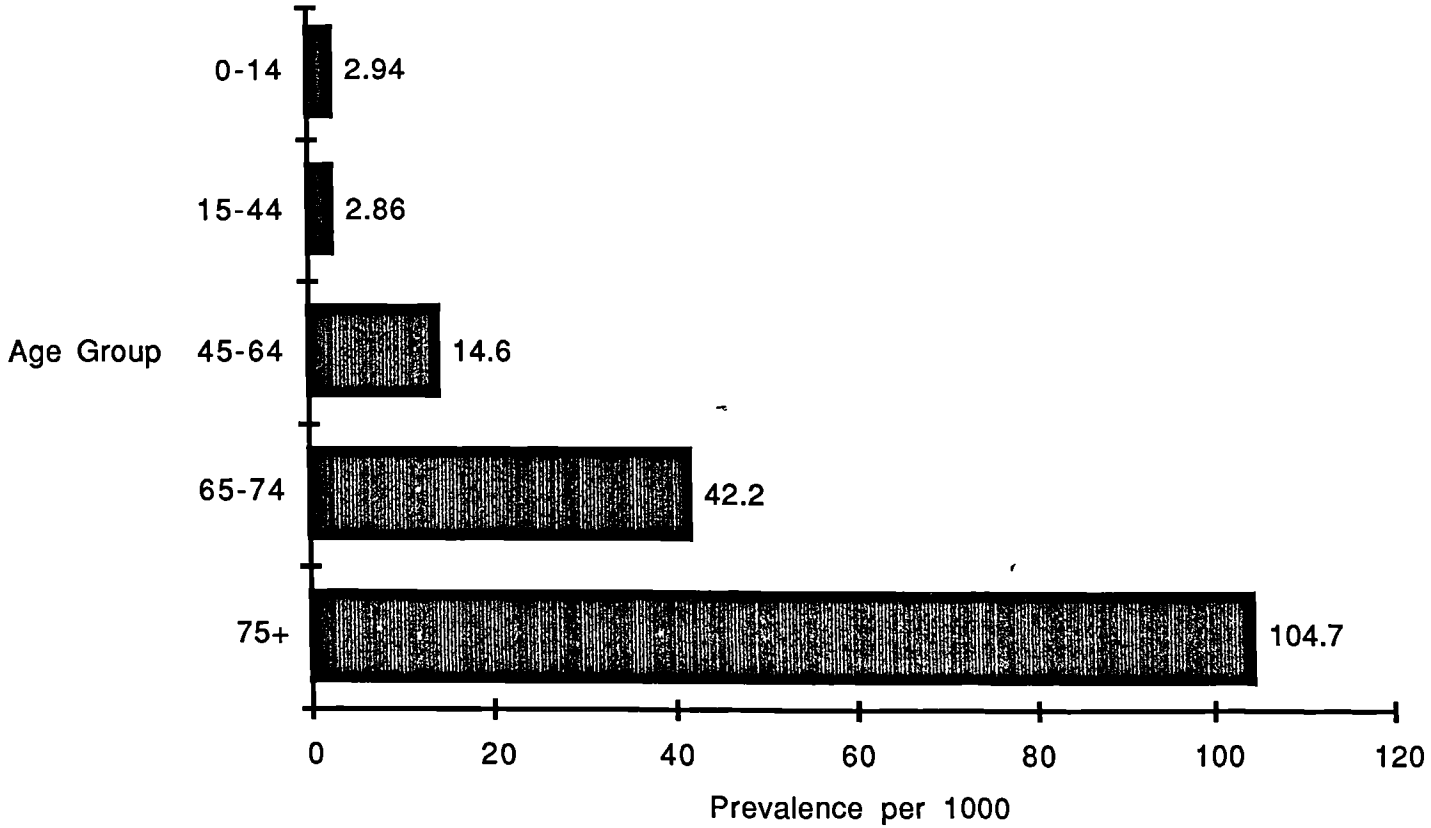
While the elderly make up the majority of the disabled population in Barnet, those aged over 64 represent only 26% of the general resident population in the Borough. Figure 7.3 shows the prevalences of disability for different age groups within the Barnet population. From this it is clear that, as found nationally, the elderly are much more prone to disability than those in younger age groups. This reinforces the importance of the geography of the elderly in explaining spatial patterns of disability.

Residential Status

The domestic arrangements and tenure characteristics of those interviewed are also of interest. 38.3% of those interviewed lived in council rented accommodation, and this is a potential source of spatial patterning, as council housing in Barnet is organised in a number of large estates. The survey did not set out to record the full range of tenures of non-council residents, the remaining 61.7% of those interviewed being coded as in "other" tenures. The significance of tenure in patterning disability prevalence is revealed when one compares the prevalence rate of 38 per 1000 for disabled people in the council rented population, with a rate of 10 per 1000 for other tenures.

Of those interviewed, 27.5% were found to be living on their own, the majority of these being elderly. The fact that a number of people with disabilities do live alone has implications for their quality of life, when one considers the types of difficulty their disabilities pose for them.

Figure 7.3 : Prevalence by age for Barnet



Disorders experienced

Table 7.5 shows the disorders which were reported in the survey by a significant number of those interviewed, together with figures taken from the Harris Survey for comparison. (A full tabulation of disorders suffered, with frequency of those reporting them, is given in Appendix 4). Both were derived from the reported cause of disability given by the person interviewed themselves. It can be seen that, as in the national survey (Harris,1971), Arthritis is the biggest individual cause of disability, being reported by 1111 people (24%) interviewed. This may be compared to a figure of 28.4% from Harris (1971,Table AIV). Blindness or partial sight was seen to affect 780 people (17%), and some form of deafness 709 people (15%). This may again be compared with figures of 6.2% and 2.0% respectively for Harris.

Of the most disabling diseases, Multiple Sclerosis, and Parkinson's Disease are two of the most common. In Barnet 108 Multiple Sclerosis sufferers were identified (2.3%), and 87 Parkinson's Disease sufferers (1.9%). The appropriate figures from Harris are 0.8% and 0.7% respectively. It is clear from these figures that the proportion of the survey group suffering from these disorders was generally greater than found in the national survey. Levels of circulatory problems appear to be lower than that found in the national survey.

In using data on disorders suffered, it is perhaps prudent to assume that, with self reported diagnoses, there can be an element of mis-categorisation of diseases. It is possible, however, to group disease categories into wider classifications which may allow us to be more confident of assigning individuals causes correctly. Table 7.6 shows the prevalence among a broader set of disorder categories than was shown in Table 7.5. In this case individuals are only counted once, even if they should have two disorders from the same disorder group. Once again the broad group going under the title of "joints and supporting structure" is the largest group, accounting for 1854 people (41%). This group contains disorders described by respondents as Arthritis, Osteo-Arthritis, Rheumatoid Arthritis, and any general disorders involving movement of the spine or joints. The W.H.O IDC codes covered are 714-729.9, and compares to a figure of 38% for a roughly similar group of disorders from Harris (1971,Table AIV).

The second largest group here is for disorders of the heart with 509 people (11%). Here this accounts primarily for those suffering from Coronary Thrombosis and Angina. This again compares with a figure of 16% for Harris. These figures are followed by those with "chest" disorders with 412 (9%), and accounting for those with

Table 7.5 : Disorders suffered by 5% or more of those interviewed in the Barnet disability survey

Disabling Disease	No. Suffering	% of all Disabled Identified+	% of all Disabled in GB*
Arthritis	1111	24	28
Blind/Partial sight	780	17	6
Deaf/Partial deafness	709	15	2
Ageing	593	11	-
Osteo-Arthritis	447	10	-
Stroke	351	8	4
Rheumatism	339	7	-
Bronchitis	335	7	4
High Blood Pressure	323	7	2
Heart- Angina	296	6	4
Cataract	282	6	-
Rheumatoid Arthritis	257	6	-
Diabetes	224	5	-

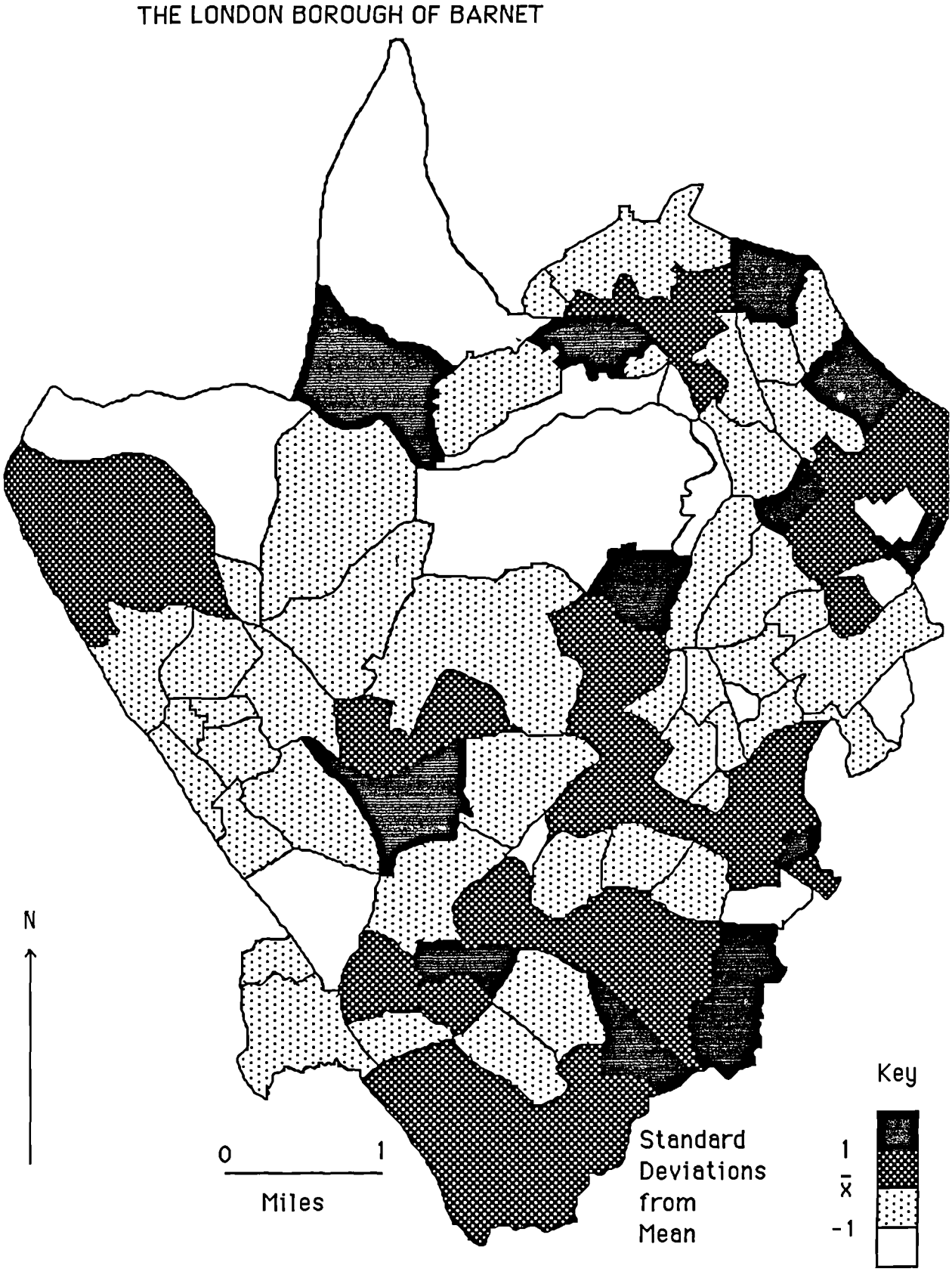
Source : + Original Data
* Harris (1971,Table AIV)

Table 7.6 : Grouped disorders for those interviewed in the Barnet disability survey

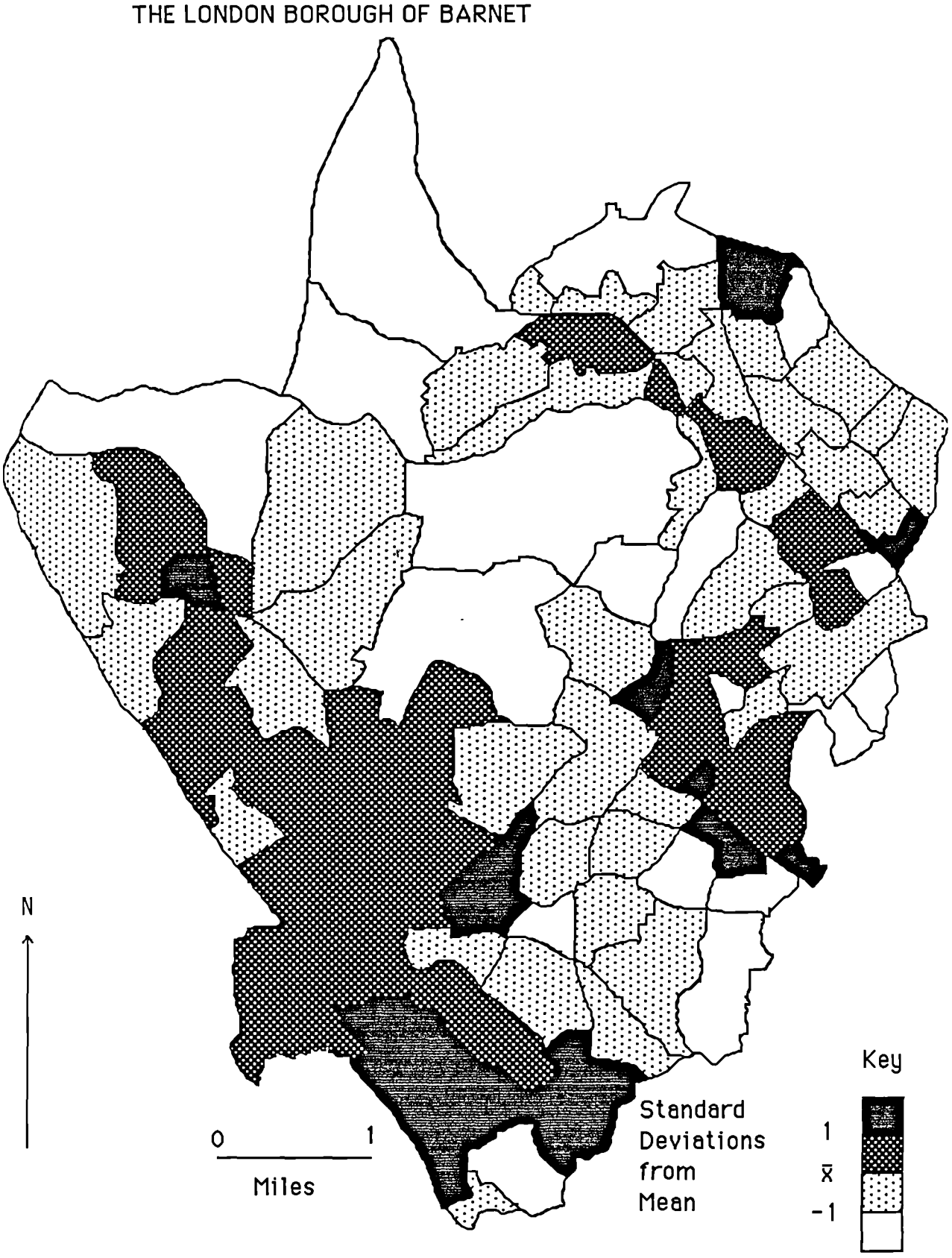
Disabling Disease	No. Suffering	% of all Disabled
Joints and Supporting Structures	1854	41
Disorders of the heart	509	11
"Chest" disorders	412	9
Stroke- Cerebral Haemorrhage	295	6

Source : Original Data

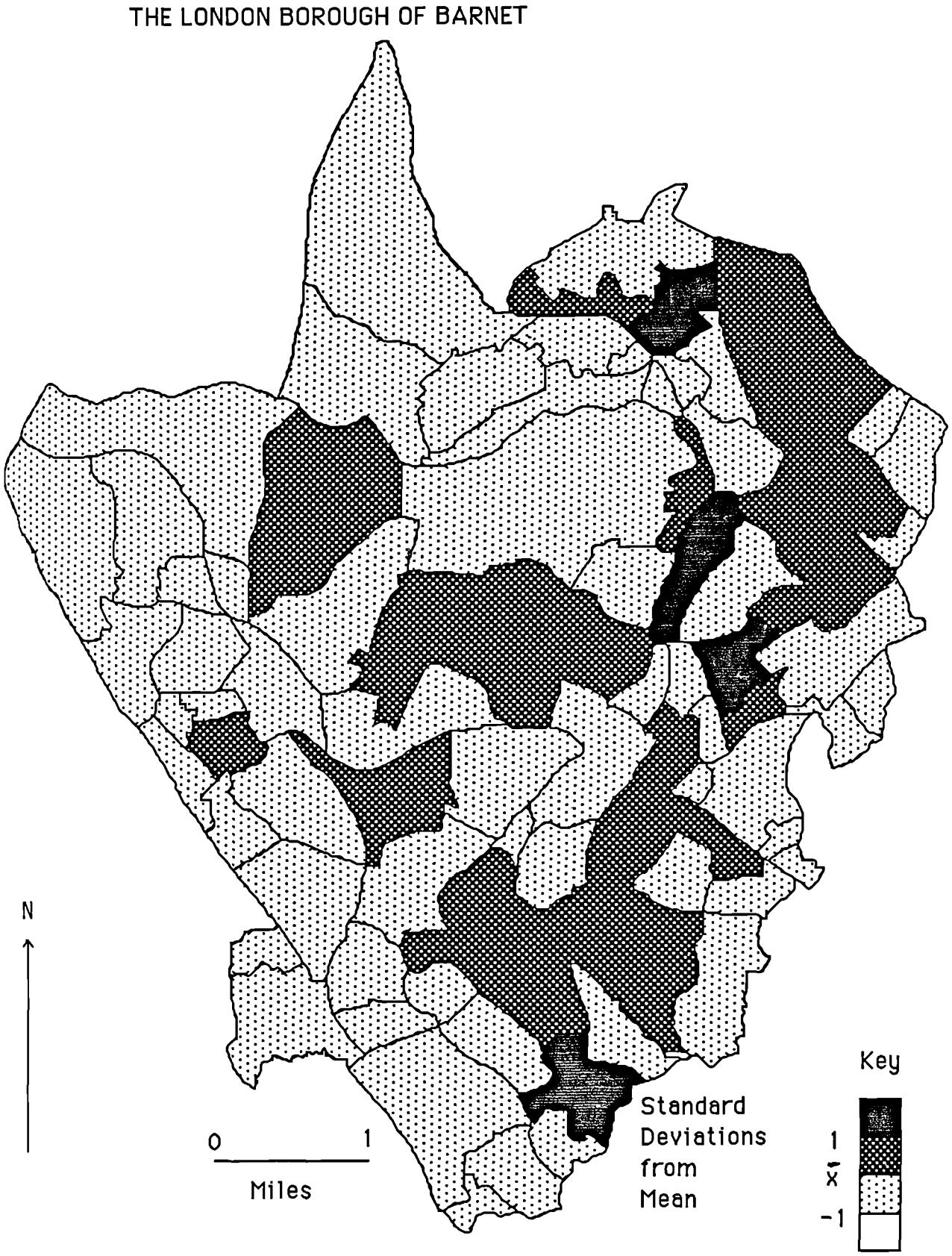
Map 7.4: Proportion of the disabled population suffering heart disorders



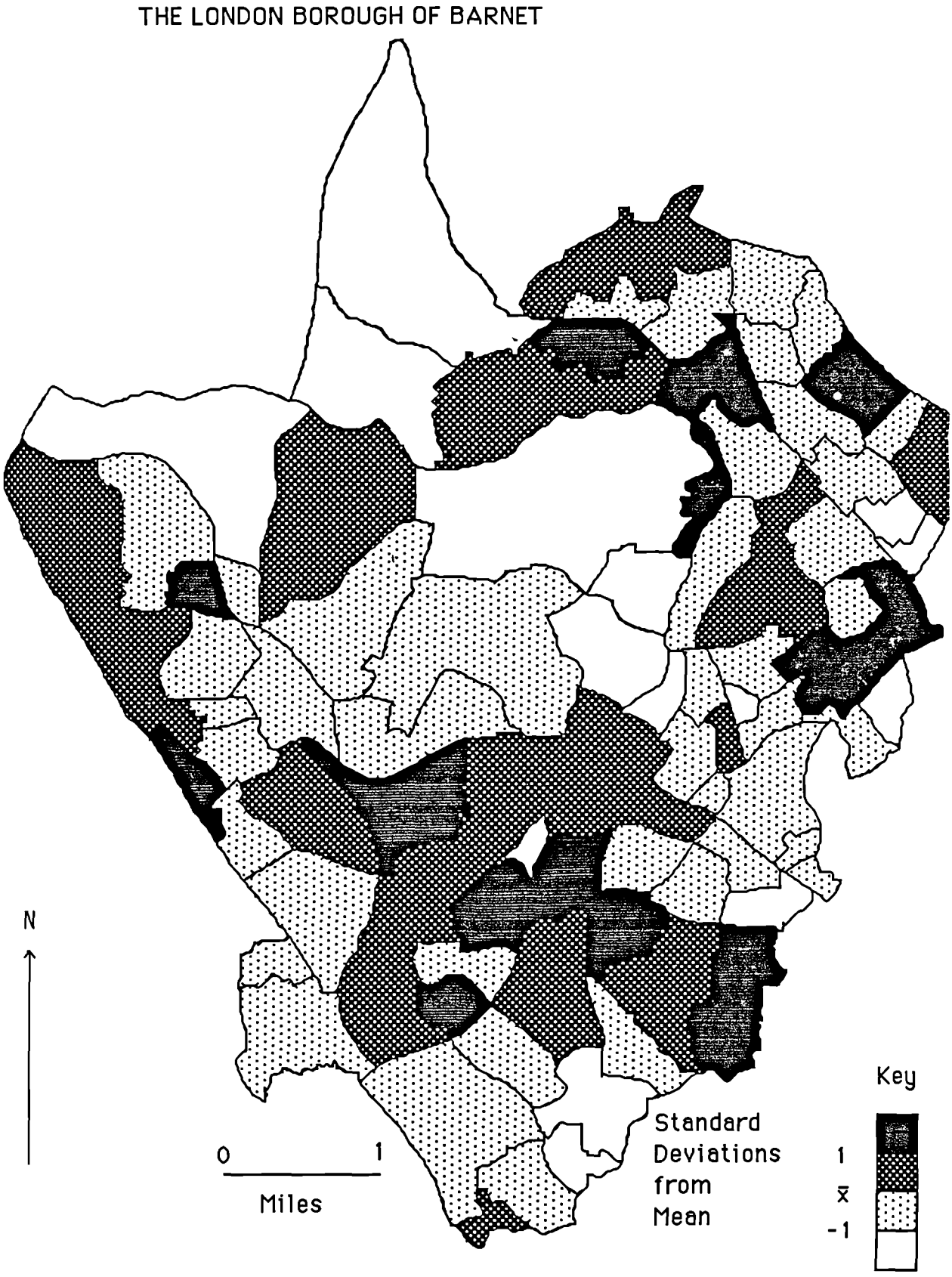
Map 7.5 : Proportion of the disabled suffering from lung disorders



Map 7.6 : Proportion of the disabled suffering from circulatory disorders



Map 7.7 : Proportion of the disabled suffering from "strokes"



Chronic Bronchitis, Emphasema, and Asthma. An almost direct comparison with Harris provides a figure of 9%. Those having suffered from strokes accounted for 285 (6%), compared to 4% in the Harris Survey. This reclassification appears to reduce the overall difference between the Outset and Harris Surveys.

Given the criticism of under-estimation levelled at the Harris Survey (Townsend,1984), it would seem that Barnet is close enough to a profile of disabling disease expected from national figures to suggest that there are no special environment or social factors that are influencing the size or the character of the Barnet disabled population. This does not, however, rule out lower frequency, local environmental factors that may be leading to high rates of particular diseases at very small scales. This may influence patterns, leading to particular areas within the Borough having significantly higher prevalences than one might expect, given the operation of the "generative" and "redistributive" factors.

Maps 7.4 to 7.7 are based on the proportion of people with disability suffering from heart, lung, and circulatory disorders and cerebral haemorrhages shown in Table 7.6. In relation to Map 7.4 which refers to heart disorders, polling districts having more than 16.1% of their population suffering from the disorder (above one standard deviation) do not appear to cluster spatially. This also appears to be the case in Map 7.6 showing circulatory disorders, although in this case the one standard deviation level is 8.2%. When on considers lung disorders in Map 7.5, there appears to be more clustering of high scoring polling districts (above one standard deviation equalling 16.3%). One group of districts can be seen in the south of the Borough in the location of Golders Green and Childs Hill wards. A second cluster can be seen in the northern part of Garden Suburb ward.

When one considers those sufering disablement through strokes, shown in Map 7.7, the degree of clustering is again more prominent than for heart of circulatory disorders. Small clusters of high scoring districts are to be found within the wards of Hendon in the south west, and on the boundry between Arkley, Hadley, and Friern Barnet wards (the New Barnet area). These clusters may be significant, and indicative of a local environmental factor. One can however, only identify whether there may be specific local environmental factors operating to create these high spots, when the operation of other generative and redistibutive factors, such as age distribution or social class have been controlled for. Some attention will be focussed in Chapter 8 on the part clusters of individual disorders have in explaining residual values from the analysis of

other causative processes.

7.7 Difficulties Experienced in Daily Living

In this section we go on to look at the consequences that disabling disorders have had on those in Barnet. The questionnaire contained a twelve category checklist to describe respondent's mobility characteristics. Table 7.7 shows the number and proportions falling within each category. Very few people could get around normally (17.3%), the largest groups being those who were generally restricted in their mobility (46.6%), or could get around only with the help of a stick or other aid (42.2%). It is interesting that while the popular idea of a disabled person is someone in a wheelchair, only 9.3% in Barnet used a wheelchair in some way, and only 2.9% were permanently confined to one. There were significant numbers of people who relied on others to guide or support them or , by implication, the help those who commonly fell.

The way in which the day to day activities of people are effected by disorders can be used as a measure of the character, and the severity of disability suffered. The "Agerholm Handicap Profile" questionnaire used in the survey contained a wide range of activities that we all find it normal to take part in. (The full list is provided in Appendix 2). Respondents were asked whether or not they had difficulty in performing these activities due to their disorders. Table 7.8 provides a "league table" of the activities affecting 20% or more of those interviewed (900 people or more). A general "gradient" exists with the largest number of people experiencing difficulty with activities most peripheral to their survival, such as cleaning windows, thorough cleaning etc.

A reduced, but still very significant number, have difficulty with more essential activities such as light cleaning and clothes washing. As one approaches the bottom end of the list we find a smaller, but still significant, number of people who have difficulty with activities crucial to daily living, such as bathing, getting on or off the bed, or preparing their own food.

It is clear that some activities are more crucial to people's well-being than others. If we look at a selection of these activities in Table 7.9, we can see that they effect some population groups differently than others. Difficulties with feeding and drinking are infrequent occurances for both young and old in the disabled population. Difficulty with preparing their own food however, is found to affect a third of those aged over 64, compared with only 14% for those aged under 65. The largest differences were found for difficulty with

Table 7.7 : Mobility characteristics of those interviewed

	No. of People*	% of Total Interviewed
Normally Ambulant	791	17.3
Ambulant but restricted	2131	46.6
Ambulant with Aid (e.g. stick, frame etc.)	1931	42.2
Ambulant only with fixed appliance	57	1.2
Ambulant only with artificial limb	45	1.0
Walks but falls	555	12.1
Walks but needs guiding or personal support	344	7.5
Walks but cannot stand/sit unaided	84	1.8
Wheelchair user	295	6.4
Wheelchair bound	132	2.9
Bedbound	28	0.6
Other	226	4.9
Missing information	31	0.7

* Note that more than one category could apply, and that summing gives no meaningful total

Source: Original data

Table 7.8 : Rank order of difficulties experienced by those interviewed- total group

Activity causing difficulty	No. of people with difficulty	% of total interviewed
Cleaning windows	3342	73.1
Decorating & maintainance	3313	72.5
Thorough cleaning	3308	72.4
Major kitchen work	3023	66.1
Stairs	2848	62.3
Minor repairs	2707	59.2
As a pedestrian	2653	58.0
Shopping	2636	57.7
Washing all over/ using a bath	2545	55.7
Garden care	2543	55.6
Foot care	2511	54.9
On public transport	2427	53.1
Reaching/picking things up	2425	53.1
Severe fatigue	2285	50.0
Washing (laundry)	2193	48.0
Light kitchen work	2152	47.1
Steps	2148	47.0
Sit/stand:stand/sit	1921	42.0
Bed making	1753	38.4
Getting in and out of the house	1753	38.3
Light kitchen work	1728	37.8
Getting on/off bed	1349	29.5
Light cleaning	1349	29.5
Using switches, windows etc.	1343	29.4
Getting up(dressing and toilet)	1309	29.4
Writing	1237	27.1
Reading	1205	26.4
Preparing own food	1140	24.9
Falling down	1130	24.7
Going to bed (undressing and toilet)	1095	24.0
Answering the door	1091	23.9
Getting in/out of the garden	1089	23.8
Hearing	1030	22.5

Source: Original data

Table 7.9 : Selected difficulties experienced by those interviewed by whether above pensionable age and whether living alone

Activity causing difficulty	- By those - Aged <65	% of all <65	Aged 65+	% of all 65+	Living alone	% alone
Getting in/out of the house	312	14.9	1488	58.8	541	36.4
Using stairs	2543	25.9	2305	91.0	819	35.5
Difficulty with shopping	555	26.5	2081	92.2	741	35.6
Getting up dressing and toilet	337	16.1	972	38.4	482	49.6
Going to bed "	297	14.2	798	31.5	394	49.4
Using the toilet	183	8.7	404	16.0	196	48.5
Washing all over/ using bath	461	22.0	2084	82.3	796	38.2
Feeding and drinking	121	5.8	160	6.3	118	73.8
Preparing food	290	13.9	850	33.6	432	50.8

Source : Original data

shopping and using stairs, over 90% of the elderly disabled having difficulty with these activities, compared with under 27% for those aged under 65. The problems of those having difficulty are compounded by the lack of available help in the home. 51 % of those having difficulty preparing their own food were living on their own, as were 74% of those having difficulty feeding.

At this stage, the degree to which a number of people suffer a combination of many difficulties, rather than large numbers suffering only one or two difficulties, is unknown. Over the years a number of researchers have put forward multi-dimensional indexes to measure degree of disability or incapacity (these having been discussed in Chapter 1). A useful attempt was made by Sainsbury (1962) in her "Index of Incapacity", shown in Figure 1.7. The index was found to be susceptible to the effect of environment, people with similar capacities in, say, going to the toilet, scoring differently depending on whether the toilet was located up stairs or on the level. Some variation was found between men and women, as men often did not undertake some of the household tasks as a matter of course. The same restrictions applied to the questionnaire used in the Barnet survey but, as found by Sainsbury (1962,pp 29), men were generally able to distinguish their true capacity from customary role expectations. The index was therefore, found by Sainsbury to perform well as an overall measure of incapacity.

A modified version of this index has been constructed from individual items taken from the Barnet survey questionnaire. The following criteria were used to translate responses to the Barnet survey into the Index of Incapacity :

Sainsbury		Barnet Survey "Difficulty with-"
1) Go out of doors on own	-	Getting in and out of house
2) Go up and down stairs	-	Stairs
3) Get about on own	-	Steps, or doors and passages, or seeing things in way, or finding way around, or falling
4) Wash down or bath	-	Washing all over /using bath
5) Dress and put on shoes	-	Getting up (dressing and toilet)
6) Cut own toenails	-	Foot care
7) Get in and out of bed	-	Getting on/of bed
8) Brush and cut hair	-	*Not included*
9) Feed self	-	Feeding and drinking
10) Go to toilet on own	-	Using toilet
11) Clean floors	-	Thorough cleaning
12) Make a cup of tea	-	Light kitchen work

13) Cook a hot meal	-	Preparing own food
14) Do the shopping	-	Shopping
15) See	-	Reading
16) Hear	-	Hearing
17) Speak	-	Talking
18) Organize thoughts in lucid speech	-	*Not included*
19) Sit or move without falls or giddiness	-	*Not included*
20) Control passing of urine	-	Weak bladder
21) Control passing of faeces	-	Weak bowel
22) Manage other special disabilities without help	-	*Not included*
23) Coordinate mental facilities in performing personal services	-	*Not included*

It will be noted that five elements of the scale are not generally translatable from the Barnet survey, and these have been excluded from the amended index. Sainsbury (1962, p 29) notes that questions in the majority of large scale applications, items 1 to 14 are adequate to categorise groups, the remaining items being useful in determining the correct allocation of some people between moderate and severe categories. It is not thought that the ommission of these particular five items will significantly undermine the effectiveness of the scale, particularily given the way that broader groupings are used in this analysis. Using the guidance provided by Sainsbury, the range of score for the amended index of 0 to 18 has been classified into the following groups :

Slight disability	0- 6
Moderate disability	7- 12
Severe disability	13 - 18

Table 7.10 shows the distribution of people with disabilities across the three categories. We can see that very few of the people interviewed (5.4%) in the survey are to be found in the severely disabled category, and that the majority of these were elderly. This does not mean that elderly disabled people are substantially more disabled than those of other ages. The proportion who are severely disabled is very similar to that found among other age groups. The percentage figures given in the body of the table show that proportionately there are more people aged over 40 in the moderately disabled category than below that age. The fact that people aged over 40 are in the majority within the disabled population, indicates that the spatial distribution of age groups may have an influence on the pattern of severity of disability.

Table 7.11 shows the relationship between severity of

Table 7.10 : Numbers of people interviewed with slight, moderate and severe levels of disability by age group

Severity of Disability	- Age Group - 0-19	20-39	40-59	60+	Total	% inter.
Slight	140	157	411	1901	2609	
%	62.2	72.4	64.0	54.5		53.4
Moderate	64	49	204	1388	1705	
%	28.4	22.6	31.8	39.8		35.6
Severe	21	11	27	198	275	
%	9.3	5.1	4.2	5.7		5.4
Total	225	217	642	3487	4571	-

Source : Original data

Table 7.11 : Numbers of people interviewed with slight, moderate and severe levels of disability by housing tenure

Severity of Disability	- Tenure - Council	Other	Total	% of those Interviewed
Slight	996	1613	2609	
%	57.0	57.1		57.0
Moderate	653	1052	1705	
%	37.4	37.2		37.3
Severe	97	160	257	
%	5.7	5.7		5.7
Total	1746	2825	4571	-

Source : Original data

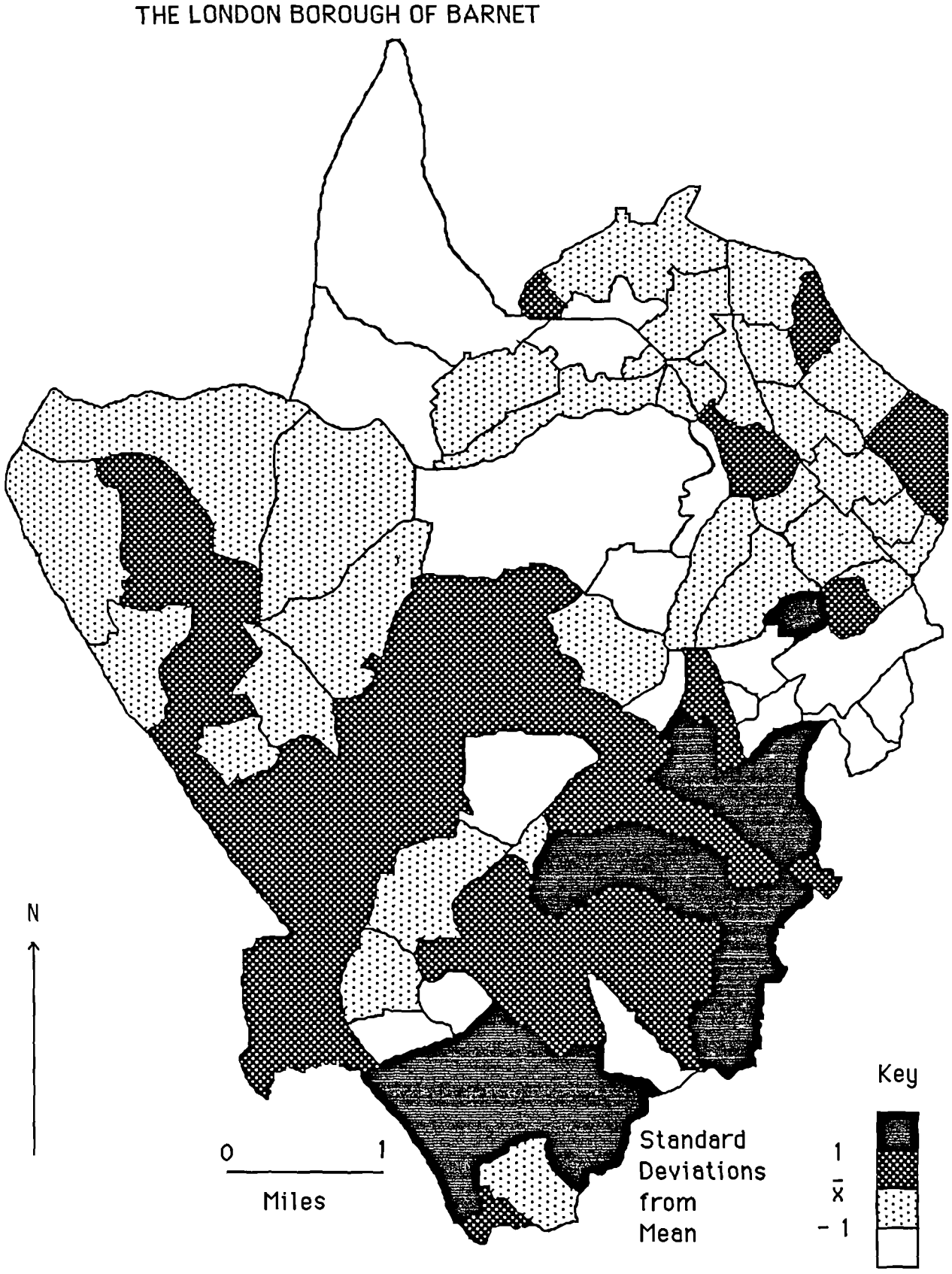
disability and residential status. In this case it indicates that there is no trend towards people in council tenures being any more disabled than those in other tenures. It would seem therefore, that the processes that control the allocation of council housing, and the nature of the people who live and grow old in them, do not in this case favour more severely disabled people. This is contrary to the evidence presented earlier that suggests the same processes do lead to more people with disabilities in general being present in the council rented sector.

Maps 7.8 to 7.10 show the proportion of the disabled population in the "slight", "moderate" and "severe" categories by polling districts. (Actual numbers of people in each category by polling district are shown in tabular form in Appendix 5 along with figures for mean and standard deviations). We can see from these maps that there are strong differences in the spatial patterns of the three characteristics. The average percentage of disabled people in the slightly disabled category across all polling districts was 50.8%. Map 7.8 shows the polling districts with the highest proportions of their disabled populations were "slightly" disabled (above 67.2%). These were to be found heavily clustered in the south west of the Borough, in Golders Green, Garden Suburb, and Finchley.

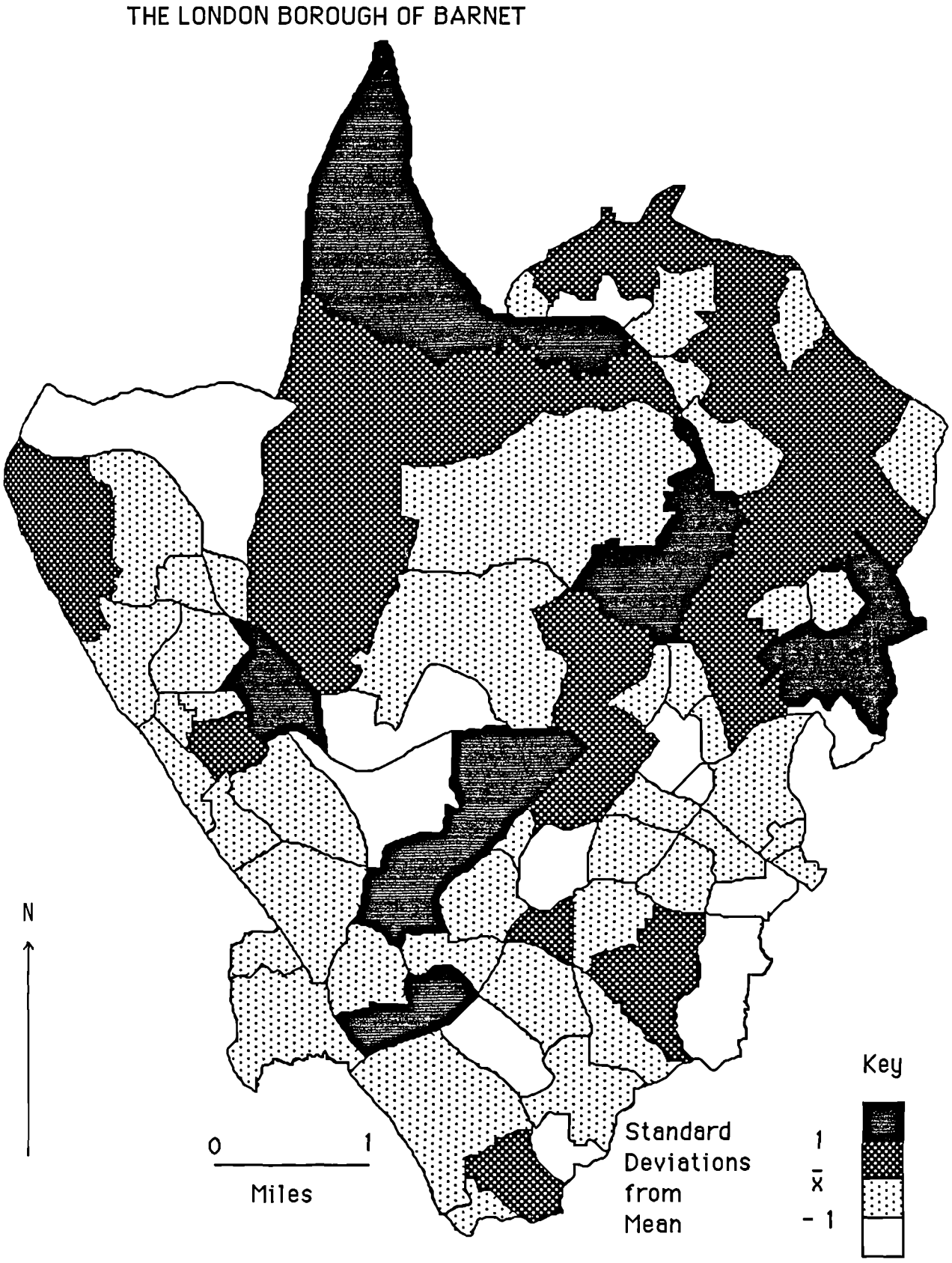
The average percentage of disabled people who were "moderately" disabled was 43.3%, and the distribution of these is shown in Map 7.9. Polling districts scoring above 59.0% appear not to cluster, but to be widely spread out across the Borough apart from the south west. Finally, only 1.6% of the disabled across all polling districts could be classified as "severely" disabled. When one looks at the distribution of that population in Map 7.9, we see a different picture again. The highest rates of severe disability are to be found clustered in the west of the Borough. These take in most of Colindale and Burnt Oak, and parts of West Hendon and Edgware. There are outliers from this pattern, in Arkley to the north, and parts of Woodhouse to the east. The fact that Woodhouse had a very low response rate in the survey, less than 40% of households responding to screening exercises, throws some doubt on the eastern cluster. It is possible that those experiencing severe disabilities may have been more inclined to identify themselves, and that the figures on severity are biased for this set of polling districts.

The patterns that have emerged may be due to the patterning of age group populations that have been shown in Table 7.10 to experience moderate and severe disability more commonly. These groups would be influential where they represent higher than average

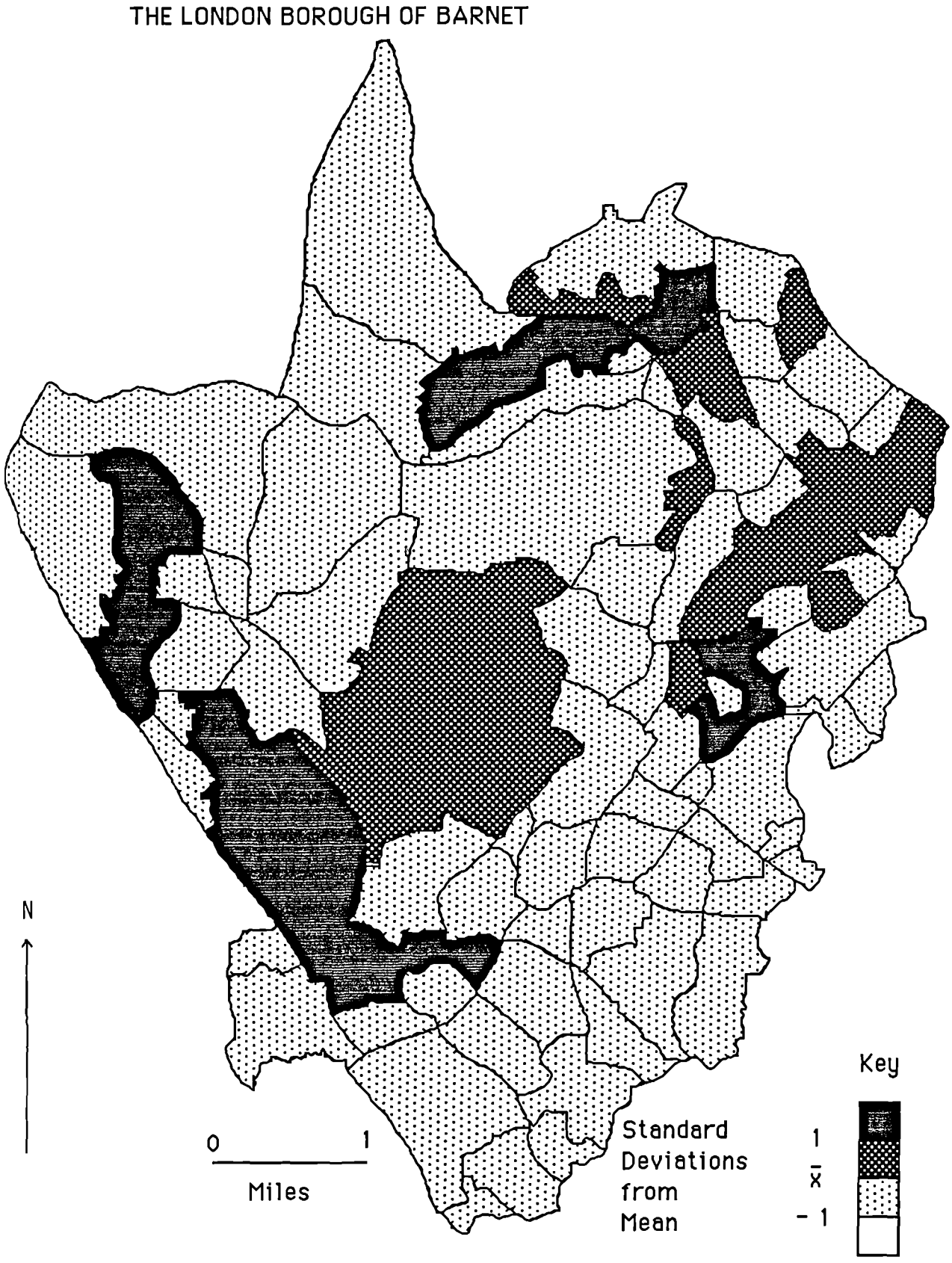
Map 7.8: Proportion of the disabled *population* *suffering* "slight" disability



Map 7.9: Proportion of the disabled population suffering "moderate" disability



Map 7.10: Proportion of the disabled population suffering "severe" disability



proportions of the disabled population. There are implications for service providers in this observation. One cannot be content with an expectation that knowledge of the spatial distribution of the disabled population is enough to understand likely demands for services. With the severity of disability having some spatial component, it is likely that the underlaying demands for help will not be in direct proportion to the distribution number of disabled people in the Borough alone.

The survey in Barnet has shown both the basic demographic and disorder profiles of the population to be similar to that expected from other surveys. The survey has also revealed a number of interesting patterns in disability prevalence, and to a lesser extent, in constituent patterns of disabling disorders and severity of disability. In the next chapter the hypotheses developed in Chapter 6 are applied to the polling district level data in an attempt to understand how such patterns may have come about.

CHAPTER 8

AN ANALYSIS OF FACTORS INFLUENCING SPATIAL PATTERNS OF DISABILITY

8.1 The Social and Demographic Context within Barnet

The survey in Barnet has shown both the basic demographic and disorder profiles of the population to be similar to that expected from other surveys. The survey has also revealed a number of interesting patterns in disability prevalence, and to a lesser extent, in constituent patterns of disabling disorders and severity of disability. The aim of this chapter is to test the the significance of the contribution made by each of the elements of the conceptual model developed in Chapter 6, to the pattern of disability observed within one Local Authority. A number of statistical techniques are used to assess the relative contribution of these elements. The techniques associated with the identification of the "neighbourhood effect" are outlined here, along with details of modifications in procedure employed in the present study. A number of additional techniques coming under the broad title of exploratory data analysis are used to highlight the influence that local housing, and socio-demographic characteristics have in explaining observed patterns of disability prevalence.

Before going on to look at the roots of patterns of disability and handicap within Barnet, it is useful at this point to look at the social patterns on which they may depend. Under the model put forward in Chapter 6, a number of characteristics of the study area may contribute to spatial differences in prevalence rates, these being split into "generative", "intervention" and "redistributive" factors. The "intervention" factors as they relate to the terms of reference of this study are to be dealt with separately in a later section, and in relation to patterns of handicap. In this section therefore, we are concerned with the factors in the community which may generate higher levels of disabling disease in one area than another, and with the processes through which people may be drawn to particular areas after the onset of disability.

In Chapter 6 it was suggested that the factors which would generate high rates of disabling disease in any area would include the number of elderly people that live there. Also included would be the proportion of the population in manual occupational classes, as well as, in particular circumstances, the proportion of people of West Indian, or Asian origin. The distribution of elderly people and of occupational classes are, therefore, of importance and will be looked at in the Barnet context. The "redistributive" factors discussed in Chapter 6 were those relating to the relative poverty

of the disabled as a group. It was thought likely that prevalences would be higher in areas having higher proportions of people living in council rented, or private rented tenure and in poorer areas displaying lower levels of amenity . The geography of housing tenures, residential amenity , and deprivation within Barnet are presented as a result. These aspects of urban life in Barnet form one of the sets of data to be used in subsequent analysis.

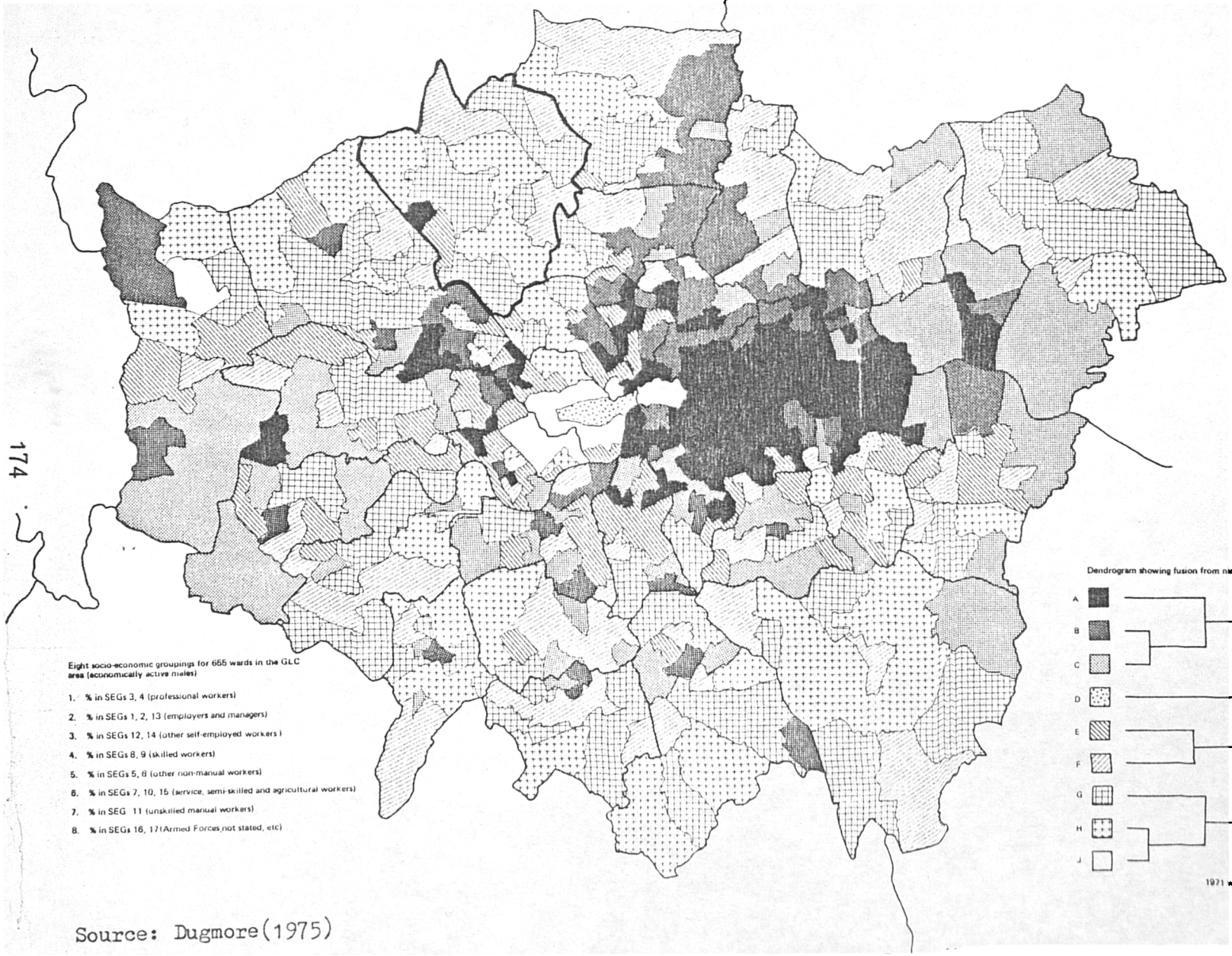
Social structure

In 1975 a study of migration and socio-economic groups was carried out in the Greater London area (Dugmore,1975). The analysis of social composition looked at economically active males, and categorised them into eight socio-economic groups using cluster analysis techniques. Wards within London were then themselves categorised in relation to these eight groups, wards with similar combinations of the eight socio-economic groups being themselves formed into groups. Nine characteristic types of ward were identified in this process. The London Borough of Barnet has twenty wards, and in 1975 was found to have wards characteristic of five of the nine types.

Map 8.1 shows the distribution of the 9 clusters across the GLC area, including those areas within Barnet, and Map 8.2 shows the detailed picture within Barnet's wards. From this we can see that Burnt Oak was the only ward within Barnet to exhibit a class A status, the main characteristics of which was that it was mainly populated by manual workers. This included higher than *GLC average percentages for economically active males in* service, semi-skilled and unskilled occupations. Burnt Oak also had one of the lowest percentages for professional, managerial and employer populations in Greater London. Burnt Oak is in fact substantially made up of the 1927 housing development "Watling", and is therefore, one of London's oldest and largest council estates. It has much in common, in social class terms, with parts of Islington, Camden and Hackney (who *coincidentally were the source of many* of it's original residents), and the Inner London Boroughs of Newham, Lambeth and Lewisham.

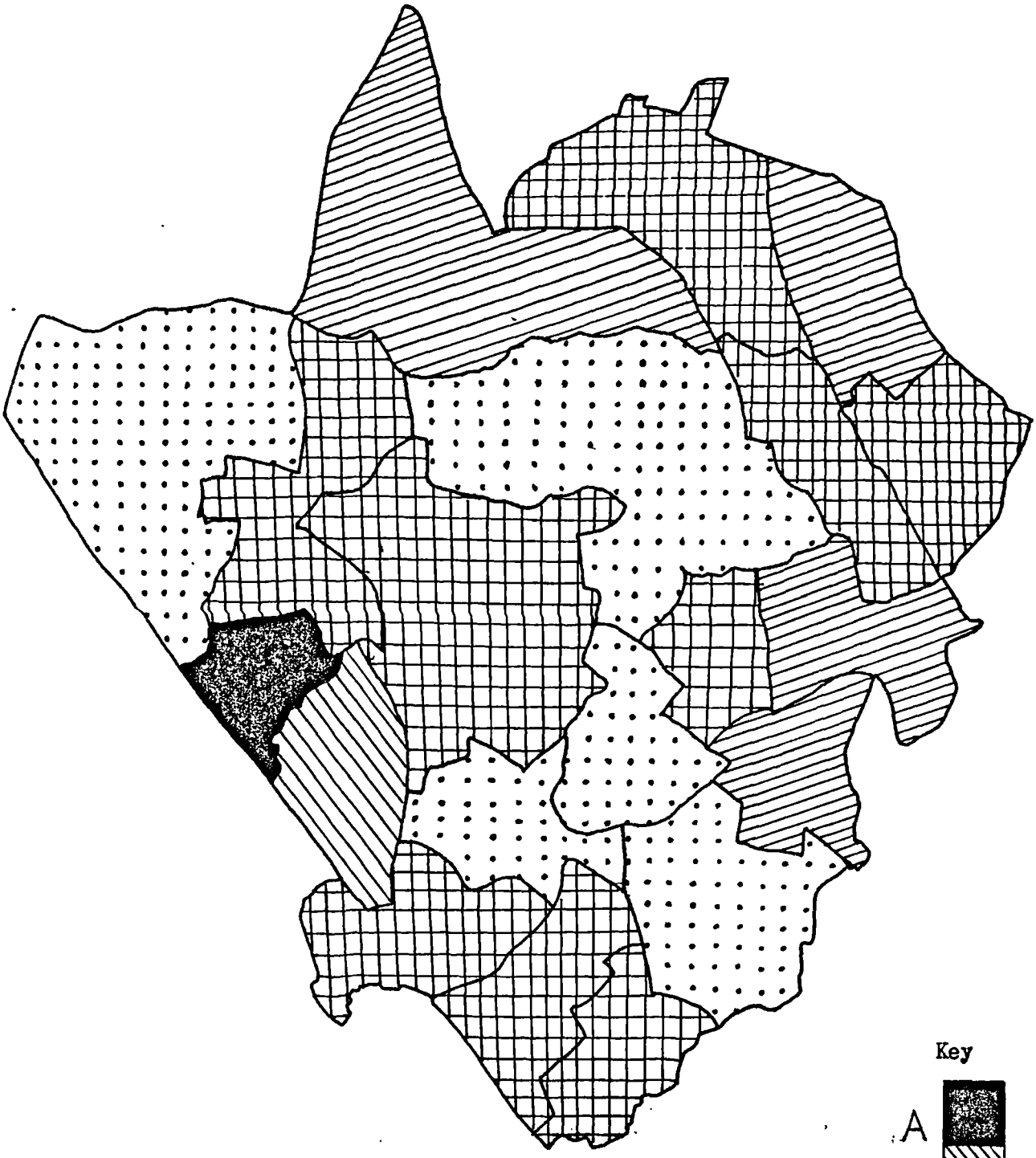
Colindale was the only ward in Barnet related to cluster E. This cluster represented a mixture having slightly above *average scores* on the percentage of other non-manual, service and semi-skilled workers, manual workers, armed forces and "inadequately described". Colindale had in 1971, the beginning of a major new council estate in its heart, and was home to Hendon Aerodrome. Staff from this military establishment were housed in a Ministry of Defence estate just within the Colindale boundary.

Map 8.1 : Location of wards in Greater London in each of nine clusters according to characteristics of eight socio-economic groupings based on 1971 census data



Source: Dugmore(1975)

Map 8.2 The Social Structure of the London Borough of Barnet in 1971



Source: Dugmore(1975)

Cluster F within Barnet is represented by Arkley and East Barnet on the northern boundary, and Woodhouse and East Finchley on the eastern fringe. The major factors here are higher than average numbers of skilled manual workers and self-employed workers. These represent more highly paid working class families than those found in clusters A and E.

The largest group of wards are to be found in cluster G and these are to be found in three groups. These are Golders Green, Childs Hill and West Hendon in the south; Hale, Mill Hill to the north; and Hadley, Friern Barnet and Brunswick Park to the east. These are all centres for white collar workers, exhibiting higher than average percentages for professional, managerial, employer and other non-manual categories.

Finally cluster H contains the five remaining wards in Barnet and is characterised again by white collar workers. Here the percentages for white collar groups are the highest in the GLC area combined with the very lowest for service, semi-skilled and manual workers. In Barnet these areas are found in a central band running from Garden Suburb in the south, through Finchley, and Hendon to Totteridge. Edgware is included and is found on the north west fringe of the Borough.

The situation in the 1980's seems to be very similar to that revealed by Dugmore in the 1970's. Table 8.1 shows the percentage of the population in each of the Registrar General's Social Classes I (professional) and II (intermediate), IIIN (skilled non-manual) and M (skilled manual), IV (semi-skilled) and V (unskilled manual) for wards within Barnet from the 1981 census. This table shows that for Barnet as a whole, 35% are in classes I/II, compared with a figure of 23.1% for Great Britain as a whole, confirming the dominance of white collar workers in the Borough in 1981 as well as in 1971. The distribution of classes I and II and IV and V are mapped in Map 8.3 and Map 8.5 at polling district scale. This confirms the results based on 1971 Census data reported by Dugmore (1975) in relation to Barnet. The highest proportions of manual workers are found in Burnt Oak and in Colindale, and concentrations of professional, managerial and employer populations are to be seen located broadly in the same areas as in 1971 (Map 8.2).

In summary therefore, Barnet is dominated by professional and managerial workers, with unskilled manual workers representing only 1.9% of the total population. There are however some interesting features within the Borough, one being the fact that the manual occupational class population is to be found in a number of small but significant clusters to the west. The

Table 8.1 : Comparison of the social class composition of Barnet and Great Britain

Registrar Generals Social Classes	% of Econ. Act. Heads of Households Barnet	Great Britain
I	8.3	4.3
II	27.1	18.8
III M	13.5	9.1
III N	17.4	26.2
IV	7.1	12.2
V	1.9	4.1

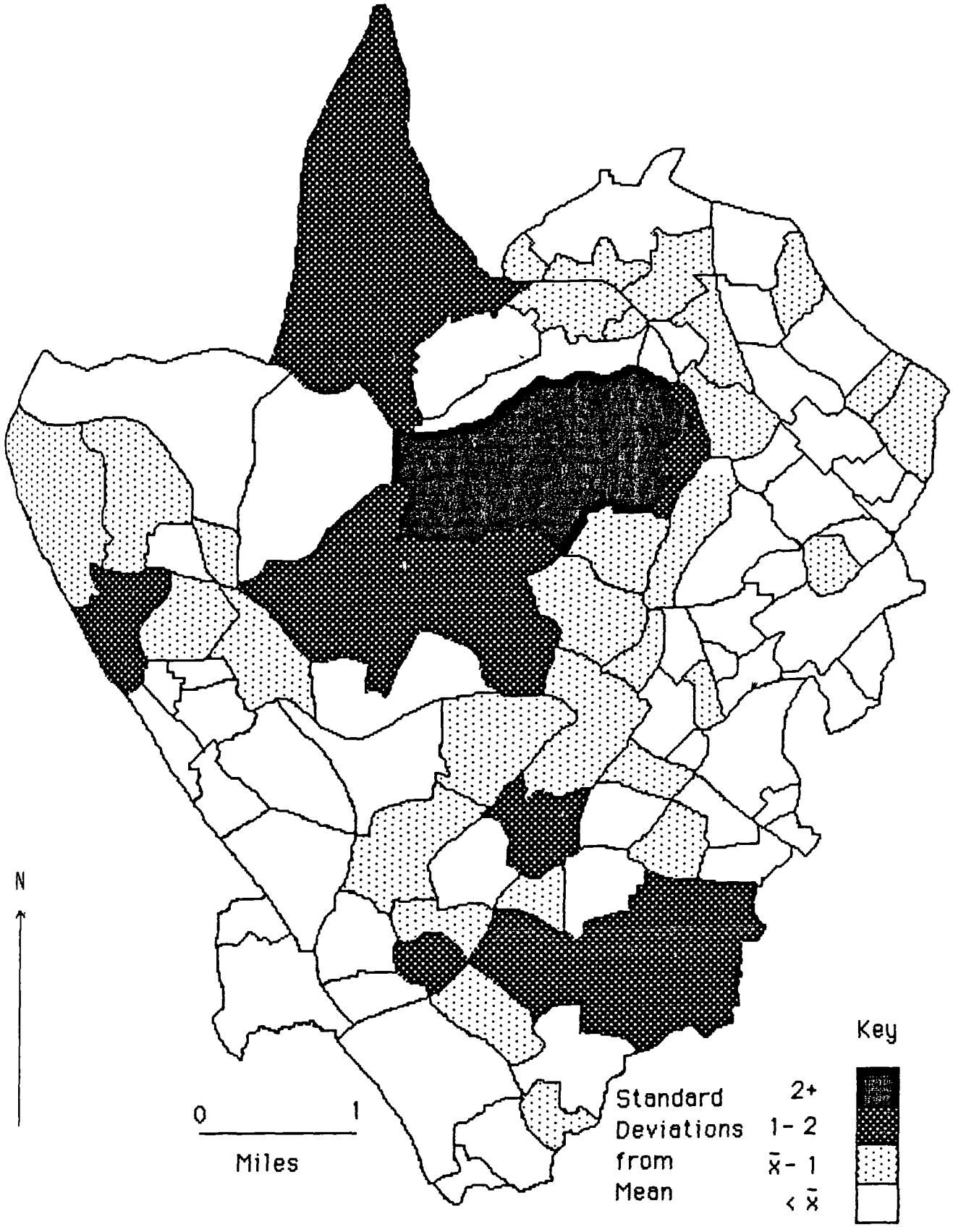
Source: Census 1981

Table 8.2 : Comparison of the age composition of Barnet with that of Great Britain

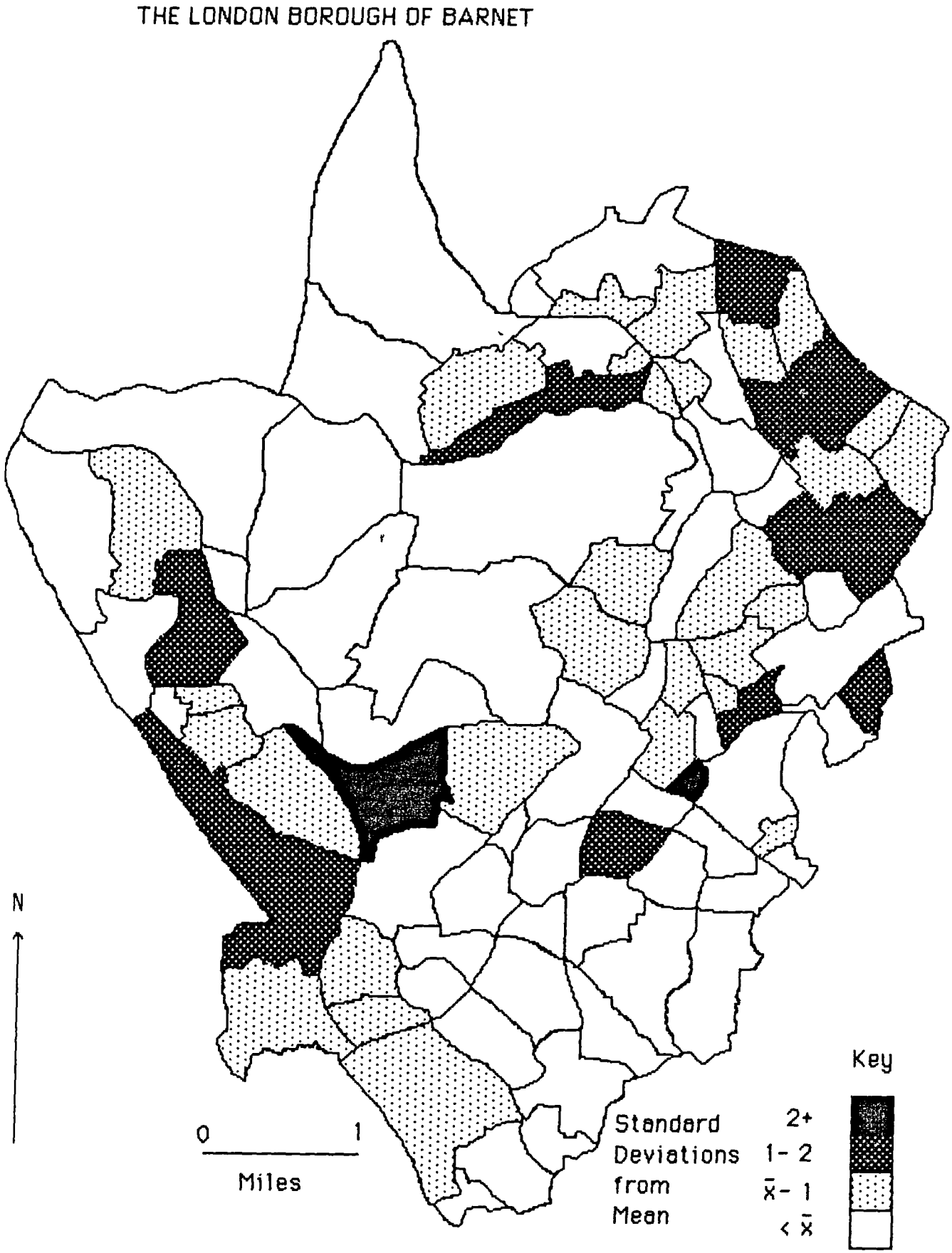
Age Group	% of resident population Barnet	Great Britain
0-4	5.7	6.0
5-15	13.9	16.3
16-24	14.5	14.1
25-44	26.7	26.3
45- Pensionable age	19.6	19.7
Pensionable age +	19.5	17.7
75 +	6.5	5.7

Source : Census 1981

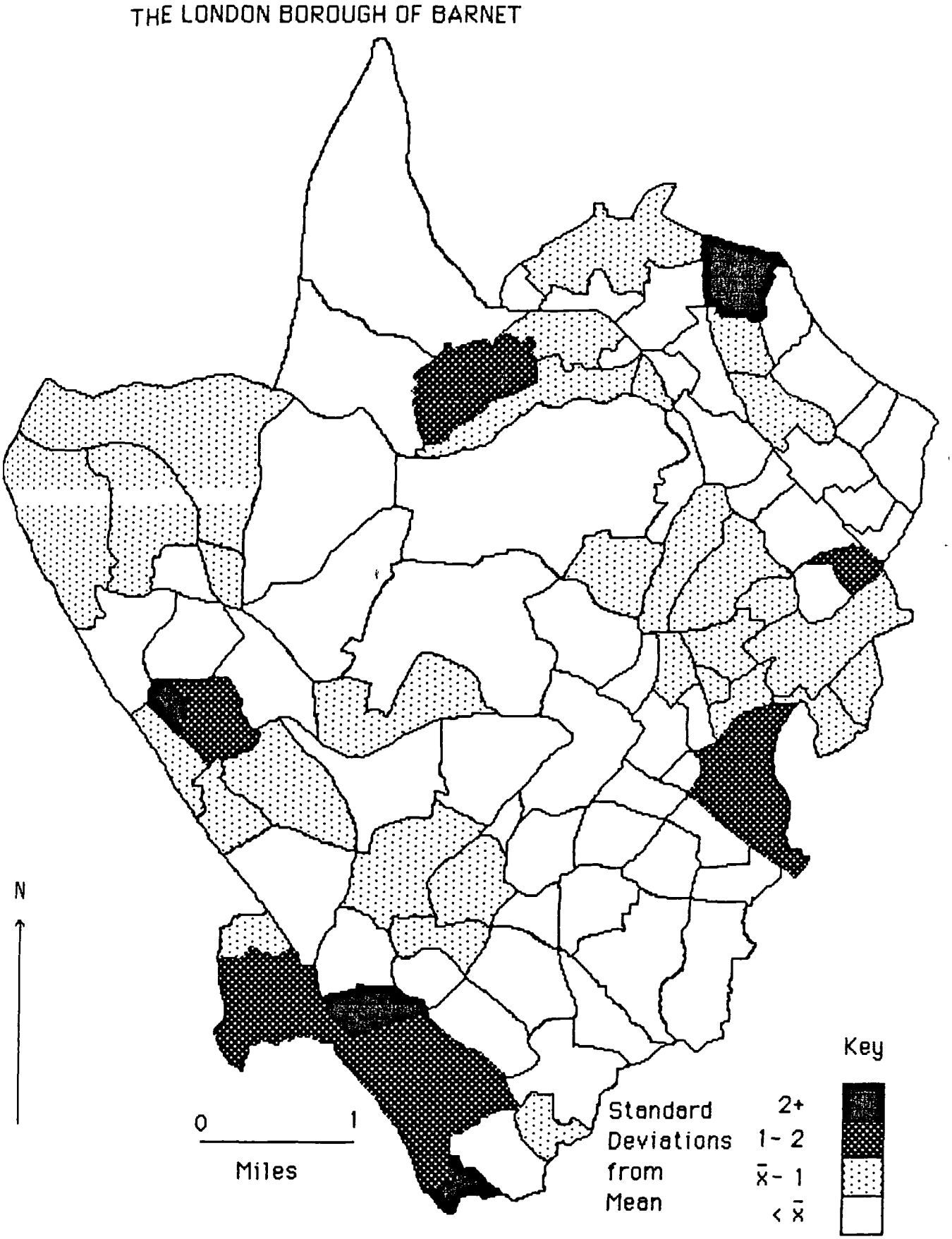
Map 8.3 The Distribution of Professional Workers in Barnet



Map 8.4: The Distribution of Skilled Manual and Service Workers in Barnet



Map 8.5 : The Distribution of Manual Workers in Barnet



operation of social planners in the 1920's and 1930's have had a major influence on the location of these groups through the decanting of inner city populations into these suburban areas. Even if in the minority, these areas represent some of the most dense concentrations of manual occupational classes in the Greater London Council area. Similarily there are a number of areas in which the professional and managerial element is very homogeneous, having the highest proportions of these classes in the Greater London Council area. The context provides an interesting prospect for the analysis of urban patterns of disability prevalence.

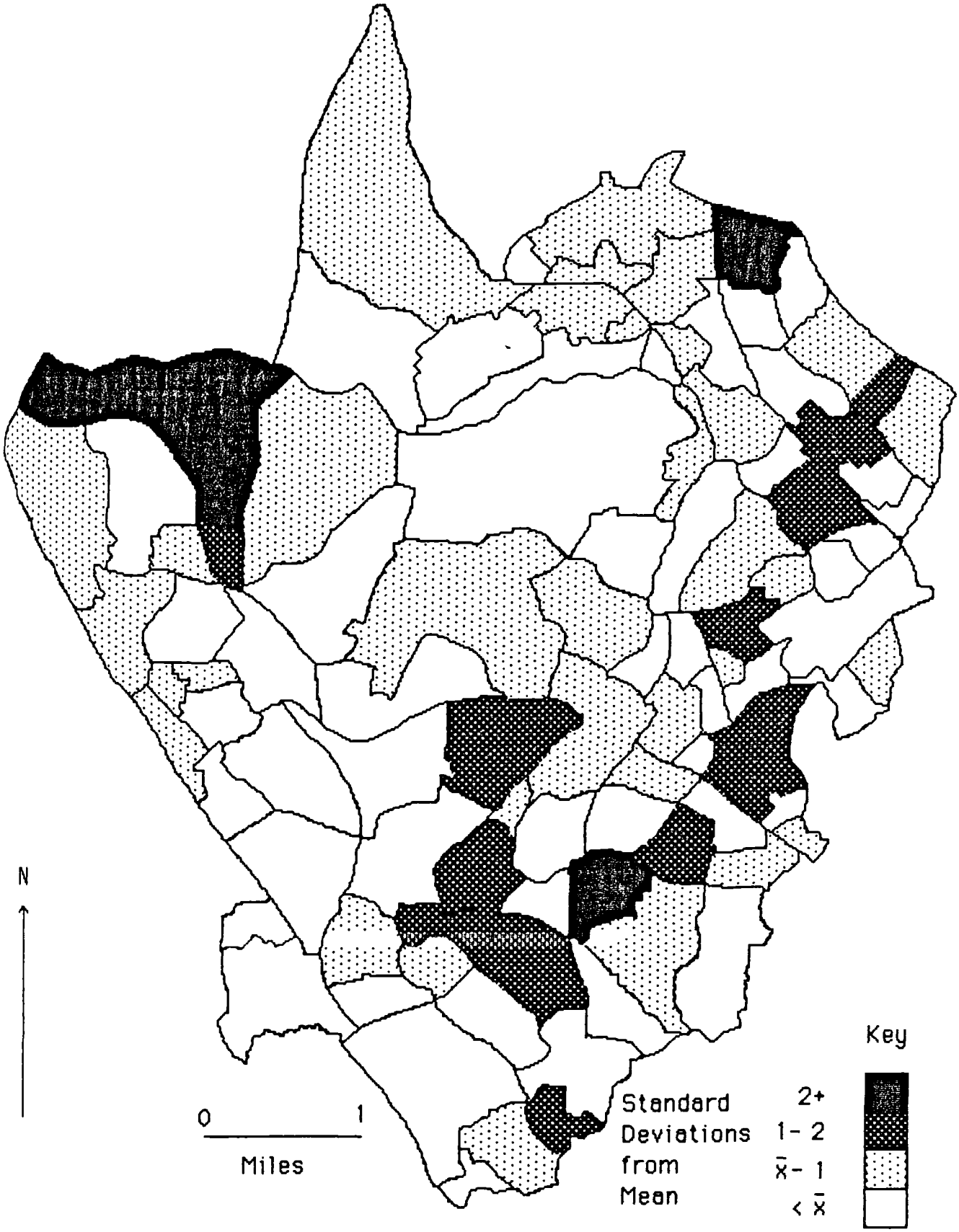
Age

The Barnet population was very similar to that of Great Britain generally in 1981. Table 8.2 provides a comparison of the relevant age distributions in Barnet and in Great Britain. This shows that the main differences appear in the 5 to 15 age group, where there are slightly less people in Barnet, and in the pensionable age groups, where Barnet has more people. In spatial terms there are seperate distributions that can be identified for those aged 65 to 74, and for those who are aged 75 and over, and these are shown in Maps 8.6 and 8.7. These show that there are concentrations of those aged over 75 in the south-west, relating directly to the site of the Watling Estate, along with the Jubilee Estate in West Hendon, part of Childs Hill in the south, and the part of the Hampstead Garden Suburb that borders St. Marylebone Cemetary. The largest concentration is found in the core of Barnet in the Mill Hill area, roughly corresponding with the large Burton Hole Farm Estate in that ward

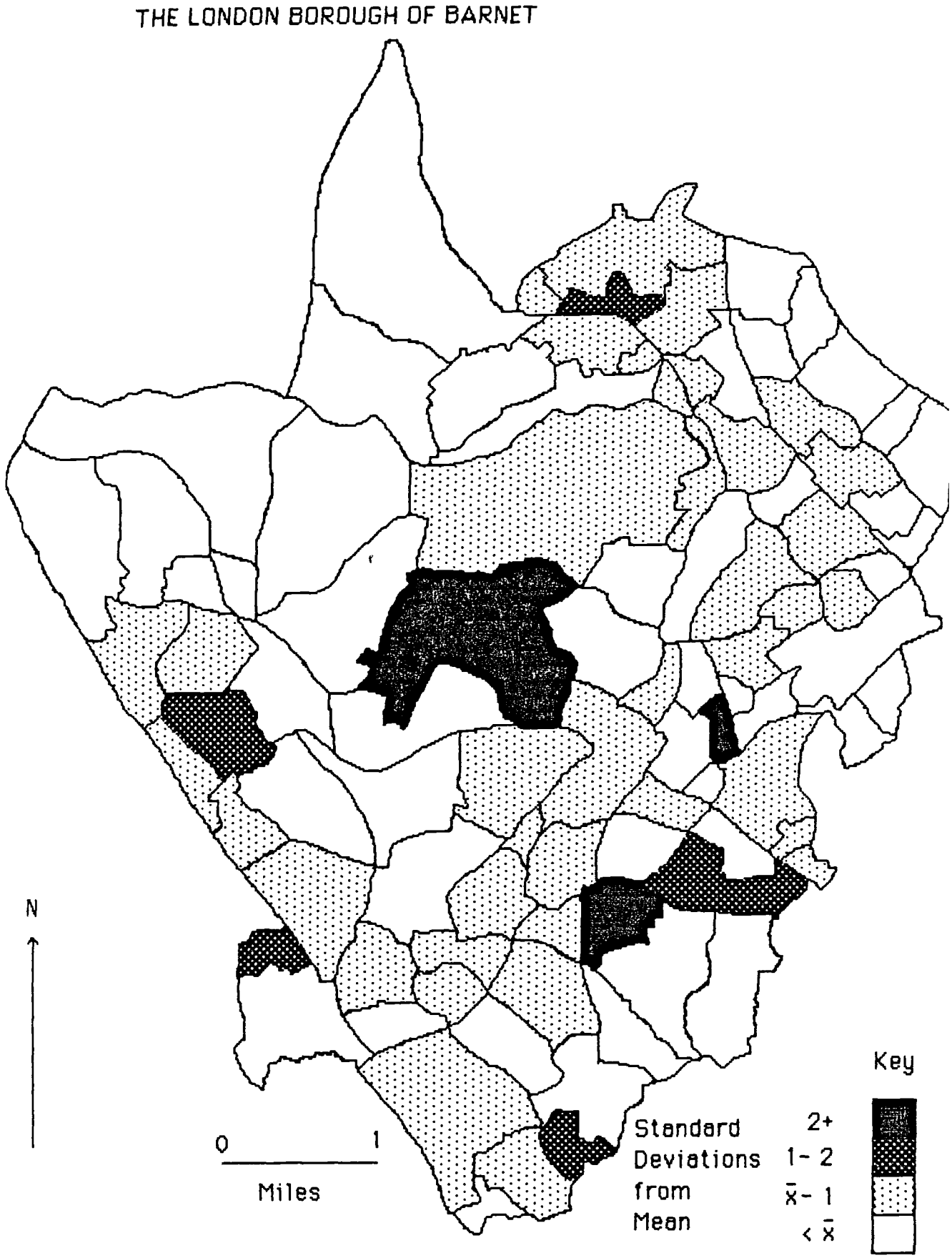
For those among the "younger" elderly, a band extends from Childs Hill in the south, through parts of Hampstead Garden Suburb and East Finchley to East Barnet. An area with a high proportion of elderly people is found in the north of Edgware. It is expected that this is an artificially high level due mainly to underoccupation. The majority of the area in question is dedicated to open space and golf, having a total polling district population of less than 500, with there being a mean polling district population of 2890 for Barnet as a whole.

The two different distributions may be interpreted as relating once again to the phases of development Barnet has itself gone through over the years. The very elderly located in the south and in the west may be associated with the processes of ageing in situ, related to the large council housing projects mounted in the 1920's and 1930's. Those younger elderly in the east may be associated with a second phase of in-migration, coming

Map 8.6: The distribution of those aged 65-74 in Barnet



Map 8.7 : The distribution of those aged 75+ in Barnet



with the rapid growth of the manufacturing sector in between the wars. This took place at the same time as the extension of the Northern Line to High Barnet, giving people living in Barnet better access to the services of the city without being constrained to live there. It has already been shown that there is a bias towards skilled manual, and administrative workers in the east of the Borough.

Housing Tenure

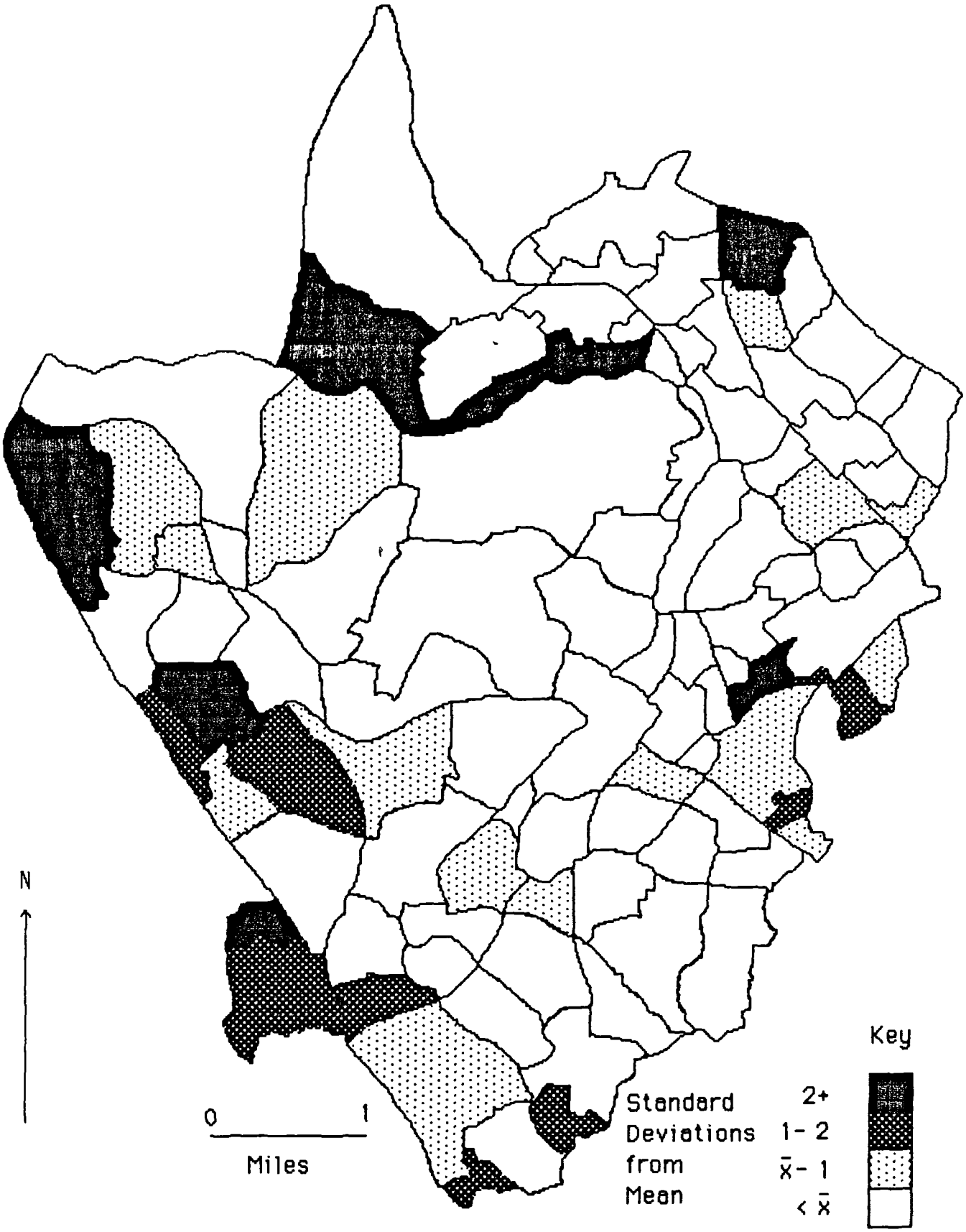
Maps 8.8, to 8.10 show the distribution of the housing tenures across Barnet. As in the case of social class, there are strong patterns within the Borough, the largest concentrations of council housing being found in the west of Barnet. The pattern once again reflects the impact the large estate has had on the Borough over the years. The private rented sector still represents 13% of the housing stock in the Borough, and the main concentrations are to be found in the south of the Borough in Childs Hill and Garden Suburb. These areas are however, relatively high quality rented sector housing in spite of their rented tenure. The percentage of owner-occupation is so high in so many areas that few emerge markedly. However, to the east of Garden Suburb is a residential area at the rear of Hampstead Heath and Ken Wood, and is strongly identifiable. This area has very high house values, some of the highest in Greater London. In addition the areas to the north of the Borough that begin to blend into the Green Belt can be identified as areas of considerable concentration of owner-occupation.

8.2 "Individual" and "Structural" Effects on Human Behaviour and Pathology

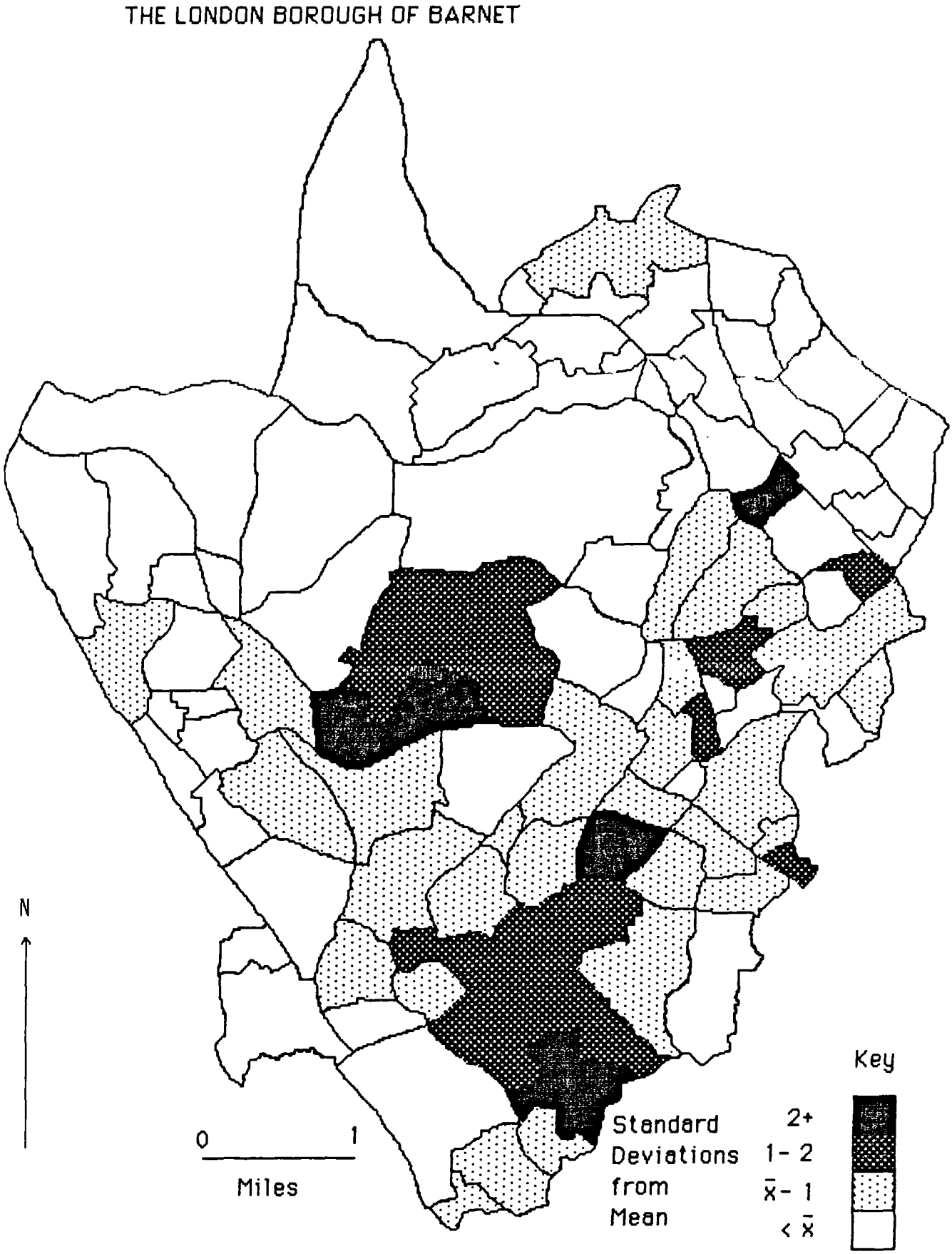
The search for explanations for urban social patterns has often involved the use of statistical association between the variables under investigation, and the creation of many aggregate measures indicative of the characteristics of the populations involved. The patterns researchers have sought to explain have included religious attitudes (Fraser, 1974), delinquency (Mays, 1972), and crime (Pyle, 1974). Others have involved the extention of the concept of Social Area Analysis into complex investigations of the social structures of our cities.

These studies have most commonly adopted a set of multi-variate statistical techniques that have come to be referred to as factorial ecologies (Herbert and Johnston, 1976). The dominant techniques have been those of Factor Analysis, Principal Components Analysis, and Multiple Regression.

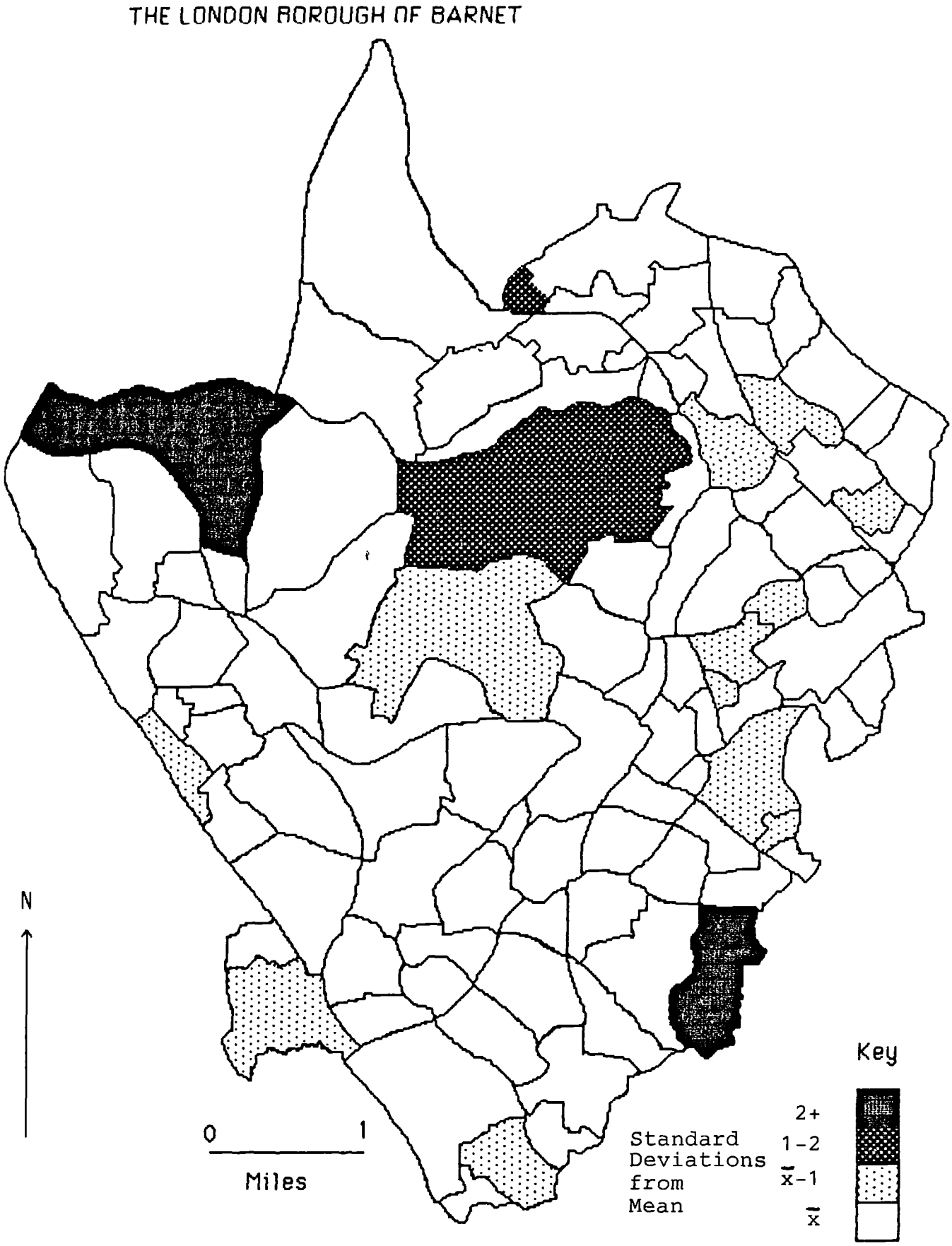
Map 8.8: The Distribution of Council Housing in Barnet



Map 8.9: The distribution of private rented sector housing in Barnet



Map 8.10: The Distribution of Owner Occupied Residential Accomodation in Barnet



Phillips (1981) in his review of the progress of medical geography has identified a number of studies involving human health problems that follow this tradition, collectively referred to by him as ecological associative studies. Under this heading might be included attempts to relate Schizophrenia to a number of environmental influences (Giggs,1973), as well as studies relating social, demographic, and physical factors to patterns of Heart Disease, Cancer, and a number of infectious diseases in Chicago (Pyle,1971; Pyle and Rees,1971).

Studies of this type have been termed "areal studies" (Johnston,1975), and have come under criticism for their attempts to infer individual characteristics and their links to behaviour or pathology from spatially aggregated data. This constitutes the problem of ecological fallacy that has been well documented over the years (Valkonen,1969;Gudgin,1975) but still remains an inherent problem in the conclusions drawn from recent studies. While the approach may be defended on the pragmatic grounds of the problems of obtaining detailed individual survey data, a number of specific criticisms have emerged.

Apart from the problem of ecological fallacy, there has been criticism of the lack of theoretical background included in such studies (Gudgin,1975). While statistical correlations may exist between patterns of behaviour and population characteristics, the mechanisms by which one may be credibly seen to generate the other are often unsubstantiated at the level of the individual. Where theory suggests that processes operate at different levels, such as at the level of the individual because of their personal characteristics, and at the level of environmental influence from outside of the individual, the areal type study cannot discriminate between them. Its power as an explanatory tool is compromised as a result. The techniques themselves have also been criticised for generating agglomerated "explanatory" variables that are broad and difficult to interprete (Baldwin,1974). This may often be the case when principal components are generated.

Johnston(1975) has suggested that a second approach may be of use in overcoming some of these objections, and has termed it "ecological study".This may be achieved through the use of a concept known as the "structural effect", in which observed human behaviour is seen to be influenced by both individual predisposition, and external forces. A certain level of any particular behaviour may then be expected based on the number of individuals with a shared predisposition to that action in the area. The level will exceed that expected if the environmental forces act on those of a contrary

predisposition and change their behaviour accordingly. A structural effect would have been observed. In a spatial context, both the people with a predisposition for the behaviour, and environmental forces might be distributed unevenly across an area, leading to the basis for a two component explanation for observed patterns of behaviour. It will be clear however, that this framework is only superior to areal study frameworks where there is a strong body of theory linking both individual predisposition and environmental forces to behaviour (or any other relevant outcome measure). There are examples of studies using this framework that have been able to provide these conditions, these having been mainly in the fields of sociology and electoral geography as we shall see.

The possible operation of individual and structural components in human behaviour was initially demonstrated by Blau (1971) in the context of welfare caseworkers in public assistance agencies within the United States. Ironically from the geographers perspective, Blau's concern was with the fact that the role of individual values and norms in formulating behaviour had been emphasised in the literature, and not the role of group norms and values. He set out to test empirically the influence of the group *factors on individuals while* controlling for their individual predispositions. The method involved using questionnaires to determine individual caseworker attitudes towards the way they carried out their work of assessing client eligibility for public assistance. Work groups of caseworkers were then categorised on the basis of whether a majority within them were in favour of raising welfare benefit levels. Similarly, individuals within the groups were classified as "pro-client" or not on the same issue. Comparisons were then made between pro-client and anti-client caseworkers, for pro- and anti-client work groups on a number of case-work performance criteria. These included whether work was restricted to merely checking eligibility or whether a deeper level of involvement with clients was attempted; number of visits per month to clients; level of worry over work; and willingness to delegate responsibilites for finance to clients.

Blau was able to confirm that for both approach to casework, and attendances both pro- and anti-client caseworkers in groups with a dominant pro-client orientation scored significantly higher than their respective counterparts in anti-client groups. He was able to conclude that structural effects do occur, and suggest a typology of these effects.

The Use of "Structural Effects" in Geography

The work of Blau and others has mainly been taken up

within the field of political geography, specifically in the investigation of the spatial components of voting behaviour. Here the major focus for the structural effect has been local influences that lead to a vote share in particular areas that is higher than might be expected from the distribution of politically partisan groups. Observations on this phenomenon go back as far as the 1930's , although more work took place in the 1950's (Cutright and Rossi,1958;Martin,1954). More recently Butler and Stokes(1974) have drawn attention to the effect of local influences on voting behaviour in British General Elections. In its geographical context Blau's structural effect has come to be known as the neighbourhood effect, to reflect the emphasis on spatially organised social group influences.

Apart from sharing the concept of a partitioned set of influences, some individual, and others based on local social group norms and values, research on voting behaviour has shared Blau's emphasis on the theoretic background for the observed effects. The prime "individual" level influence on voting behaviour has been seen as the social class of the voter, especially in the British context (Cox,1968; Alford,1963). There has also been much interest shown in the mechanisms that might bring about the "neighbourhood effect". Hypotheses included the existence of spatial differences in the level of activity of political parties, and the results of selective migration of people with particular political preferences into areas of a supportive political milieux. However the hypotheses that won the most favour were those involving the idea of dominant flows of information favouring particular parties at local levels. Both Cox (1971), and Cambell and Alexander (1965) have referred to the way that individuals exposed to dominant group standards will tend to assimilate these standards as their own and that these may form a source of political action, even if objectively they are not members of the dominant group.

The use of neighbourhood effects in modelling spatial patterns of behaviour.

The identification of the existence of neighbourhood effects, and an assessment of their intensity require two sorts of data; survey data on the behaviour under consideration and it's relationship to group membership; aggregate data on the spatial distribution of the behaviour and the social group under consideration. There are variations in the precise method of calculation, mainly depending on whether one wishes to merely identify whether a neighbourhood effect exists, or if one wishes to make more detailed statements on the nature of the neighbourhood effect. One method has been described by Cox (1971,pp30-32) in respect of the

pattern of voting responses in relation to the party preferences of particular social classes. Another variation has been put forward by Johnston (1975).

The basic method is the same in most versions of the approach. Firstly a probability matrix representing the voting preference of two social classes for two political parties is required, based on relevant individual survey data. Such a matrix is presented in Table 8.3. Each element of the matrix Pij represents the probability of a member of social class i voting for political party j. In this example the probabilities sum to 1.0 horizontally. It is possible using equation (1) to estimate from the combination of probabilities, and the percentage of social class i residents living in an area, the expected vote for party j due purely to social composition.

$$\hat{Y}j = pXj + q(1-Xj) \qquad (1)$$

where:

$\hat{Y}j$ is the expected vote for party Y due to the social composition of area j
p is the probability of a member of social group X voting for party Y
q is the probability of a member of social group $\bar{X}$ voting for party Y
Xj is the proportion of area j's population in social group X.

Cox points out that this formula is not a regression equation, the prediction being made on empirical data identifying actual social group preferences for the two political parties. If the data on actual voting behaviour across the areas in question is used, the difference between these actual voting proportions, and those expected from the social composition of the areas, Dev.j, may be calculated using equation (2), and attributed to two further factors; the neighbourhood affect, and random error.

$$Dev.j = Yj - \hat{Y}j \qquad (2)$$

Where:

Yj is the actual number of people voting for party Y
$\hat{Y}j$ is the number of people voting for party Y estimated from class composition

In this case however Cox had argued for the existance of two subordinate affects to that of individual social class and voting behaviour; neighbourhood affect and the affect of "locational groups". The conceptual arguments

Table 8.3 : Probability matrix for voting preference

	Party Y	Party Z	
Class X	p	r	p+ r = 100%
Class V	q	s	q +s = 100%

Matrix Pij

Table 8.4 : Prevalence matrix for ageand disability

	Disabled	Not Disabled	
Age X1 Group	p1	q1	$p_1 + q_1 = 1000$
Age X2 Group	p2	q2	$p_2 + q_2 = 1000$
Age X3 Group	p3	q3	$p_3 + q_3 = 1000$

advanced by Cox indicated that the higher the proportion of the population of area j in social class X, the more likely the information fields generated would swing non-class X members to vote for party Y, leading to a "neighbourhood effect" on voting patterns. Cox used equation (3) to estimate Dev.j, using social class composition Xj.

$$\hat{Dev.j} = a + bXj \qquad (3)$$

It is suggested that the intensity of the neighbourhood affect is indicated by the size of the coefficient b. Cox goes on to suggest that the remaining residual values (Dev.j - $\hat{Dev.j}$) can be seen as representing the impact of locational group influences on voting behaviour, and random variation. Using this method Cox was able to demonstrate the existence of significant neighbourhood effects in voting behaviour in the 1956 French elections for Paris.

There are problems in the methodology as described by Cox, primarily relating to the treatment of residuals from the application of the social composition factor in equation (3). Dunn (1977) has pointed out that the application of a linear relationship in an attempt to quantify the extent of the neighbourhood effect may be over simplistic. The processes underlaying the neighbourhood effect may well result in a non-linear relationship between dominance of social class groups and the effect, in which case non-linear equations may produce a more satisfactory fit to residuals Dev.j. In addition the regression part of the analysis which produces estimates of Dev.j ($\hat{Dev.j}$), may still suffer from problems of spatial autocorrelation of residuals, which would undermine the assumptions of the Generalised Linear Model. The method does however, allow the influence of factors other than the neighbourhood affect on the observed patterns of behaviour to be investigated. The residuals that result from the final regression of the neighbourhood effect can be compared to other influential variables with a view to extending one's explanation of the pattern observed.

The extention of ecological analysis to the social geography of disability

The fact that the conceptual model put forward in Chapter 6 has factors that work at the level of the individual, and others which work at the level of the characteristics of areas themselves makes the methodology presented above attractive. While the methodology laid out above can form the basis for investigating the relevance of the conceptual model of patterns of disability prevalence given in Chapter 6, the subject material of this study requires that a number of modifications be made.

Firstly, not all of the individual effect in the case of disability can be related to one set of population characteristics, as is the case of social class in voting behaviour. We do however have age as a relevant individual level characteristic linked to the probability of disability, and this will be used in a similar way. With the relevant age groups being of a larger number than the two class models in political geography, the application of individual probabilities will be carried out in a more direct manner. Table 8.4 provides a variation on the data presented in Table 8.3. The predicted number of disabled people in an area will be calculated using formula 4.

$$\hat{Y}j = \Sigma pi * Xij \qquad (4)$$

Where, in this case, $\hat{Y}j$ is the *expected number of* disabled people due to the age profile of the area j, pi is the prevalence of disability in age group *i*, and *Xij* is the number of people in age group i in area j.

In terms of the "generative" factors identified in Chapter 6, ideally one would like to include social class as an individual level variable, producing a set of joint age/class prevalences to apply to the age/class compositions of each areas population. However the occupational class of those disabled persons involved in the data are not known. The occupational class of individuals still remains a potential influence on prevalence of disability, as it is independent of age, and may well directly influence prevalence among social sub-groups of the elderly. This variable will be introduced at the spatial level using census, rather than survey data and, although a pragmatic solution, this will allow some measure of testing for the hypotheses 2 and 3 presented in Chapter 6. The adoption of the approach suggested by Johnston (1975) is used in preference to that of Cox outlined above. This is because in the Cox approach the aggregate variables are introduced to explain residuals derived from the application of the individually based model. In this study, Cox's approach would not allow occupational class to be used as a control on the individual effect of age related prevalence. Should the distribution of the elderly be such that prevalence related to age fully explained observed levels of disability, equation (5) would produce a good fit.

$$Yj = \hat{Y}j \qquad (5)$$

Where:

Yj is the actual number of disabled people in area j, and $\hat{Y}j$ the estimated number from equation (4). Should this be the case it would effectively rule out any

other generative or redistributive effects. If it did not satisfactorily explain the observed pattern equation (6) would apply, with the slope coefficient b being significantly greater than 1.

$$Yj = a + b \hat{Y}j \qquad (6)$$

The effect of occupational class composition of areas on levels of disability can be added using equation (7).

$$Yj = a + b1 \hat{Y}j + b2Sj \qquad (7)$$

Where Yj and $\hat{Y}j$ are as before, and Sj is the proportion of the population in a particular occupational class, or any other aggregate variable (Johnston,1975; pp121).

While the power of the analysis will suffer as a result due to the problems associated with the ecological fallacy, the combination of survey data where it is available, with census data is arguably of more power than the use of aggregate data alone. It certainly allows the direct testing of age related hypotheses, and therefore provides a good basis for determining the influence of other variables involved in the generative and redistributive model framework.

The Influence of Environmental Hazard

It has been suggested in Chapter 6 that the nature of the disorders causing disability on a large scale within Barnet are primarily related to general processes, such as ageing. The level of influence of environmental hazards, either in the natural or residential environment, will be of secondary importance in determining patterns of disability for the whole of Barnet. They may however, still be significant at a very local scale. The main task is seen therefore, to be to identify areas with higher than Borough average prevalence rates of particular disorders, and which are typically clustered locally, or which may throw light on high residual values from models based on the main generative factors. Techniques similar to the mapping of Standardised Mortality Ratios is employed to this end.

8.3 The Influence of Age Structure on Patterns of Disabling Disease

As links have been established between many of the most common disabling diseases and old age, it is useful to start the investigation of generative factors by assessing their influence on levels of disease direct. Taking the data on age specific disease prevalence rates from the Barnet Disability Survey, the number of people suffering from a disorder in each of five age groups

could be estimated directly. The prevalences, expressed as rates per 1000 of the general population, were derived by dividing the total number of people found to have a disabling disease of a particular type, by the total number of people in Barnet of that age range. These age specific prevalences are shown in Table 8.5. For each polling district within Barnet the number of people in the general population of each age group was derived from the 1981 Census. The age specific prevalences shown in Table 8.5 were applied to each polling district in the manner described in equation (8). The resulting estimates for each separate age group were summed to provide a polling district estimate of people suffering from each relevant disorder.

$$\hat{D}j = (a*A1j+b*A2j+c*A3j+d*A4j+e*A5j)/1000 \quad (8)$$

Where:

$\hat{D}j$ is the estimated number with a particular disabling disease in area j
A1-A5 are the total numbers of people in each age group in area j
a-e are the prevalences per 1000 population of the disease in question, for the particular age group.

A morbidity ratio was derived by dividing the actual number of disabled people observed to have the disease in question in each area, by the expected number derived in equation 8, and multiplied by 100 to form an index. This is the same method used to derive Standardised Mortality Ratios, and in this case it was used to derive figure for numbers suffering from Heart Disorders, Chest Disorders, and Strokes. The distribution of these Standardised Morbidity Ratios are given in Figure 8.1. It can be seen that the ratios are skewed. The ratios have been mapped in Map 8.11 to 8.13.

In Map 8.11, relating to areas having high morbidity ratios for chest disorders, the large council estates emerge clearly as having much higher rates than one might expect from demography alone. The estates of Watling in Burnt Oak, the large Colindale estate, and the Jubilee Estate in West Hendon, all stand out in the West of the Borough laying along-side the A5 trunk road. The association with council tenure is strengthened when one considers Map 8.12 showing those with heart problems. Again there are strong similarities to Map 8.8 which showed the distribution of council housing in the Borough. In the case of heart disorders there are high levels of heart problems in the western council areas, but in addition the areas with high proportions of council housing to the north in Edgware, and Arkley are also to be seen.

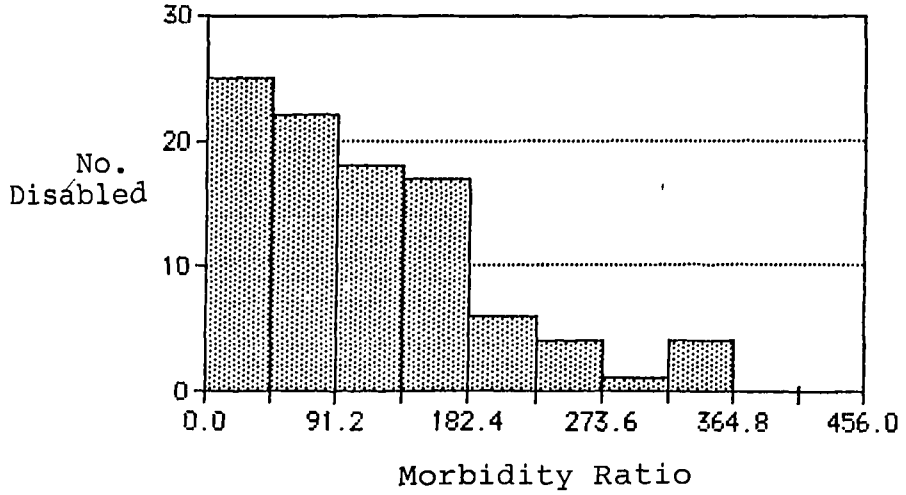
Table 8.5 : Prevalence of disabling disease applied to total polling district populations, by age group

Disease	Prevalence per 1000 Population Age Group				
	0-14	15-44	45-64	65-74	75+
Disorders of the heart	0.00	0.00	1.66	5.62	10.19
"Chest" disorders	0.00	0.05	0.50	5.83	11.94
Stroke	0.00	0.00	1.24	3.34	6.76

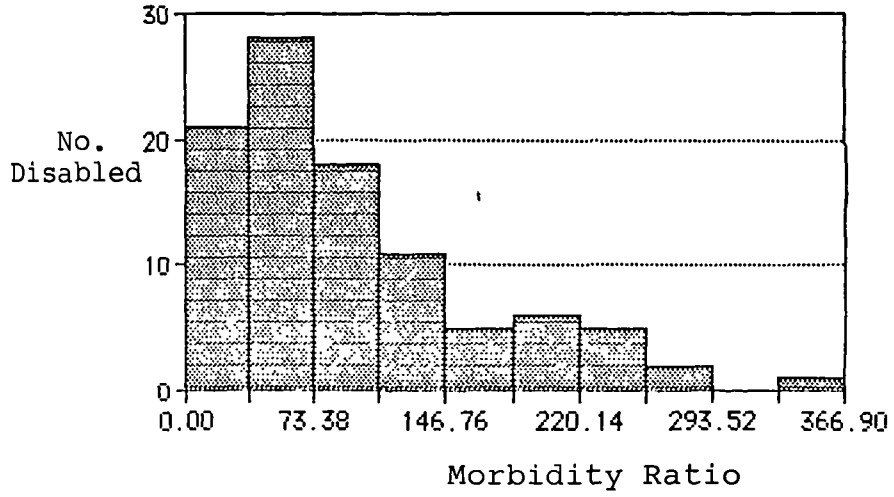
Source : Original Data

Figure 8.1 : Distribution of Standardised Morbidity Rates*

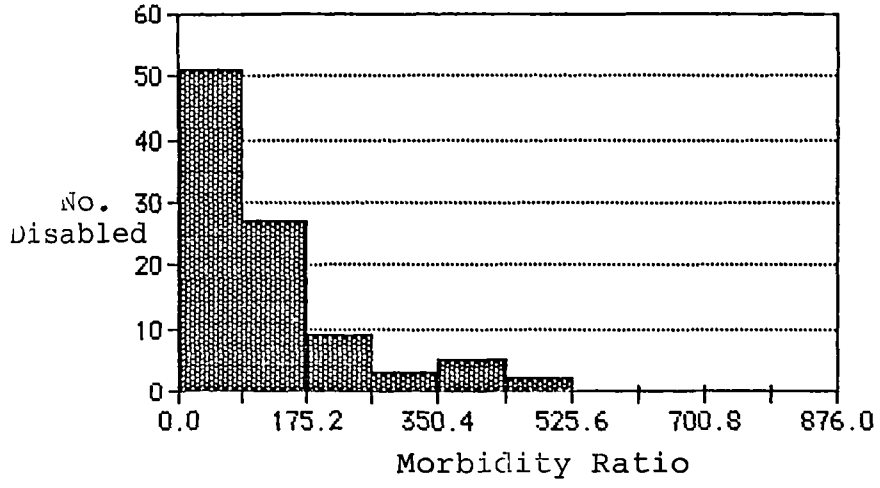
Chest Conditions



Heart Conditions

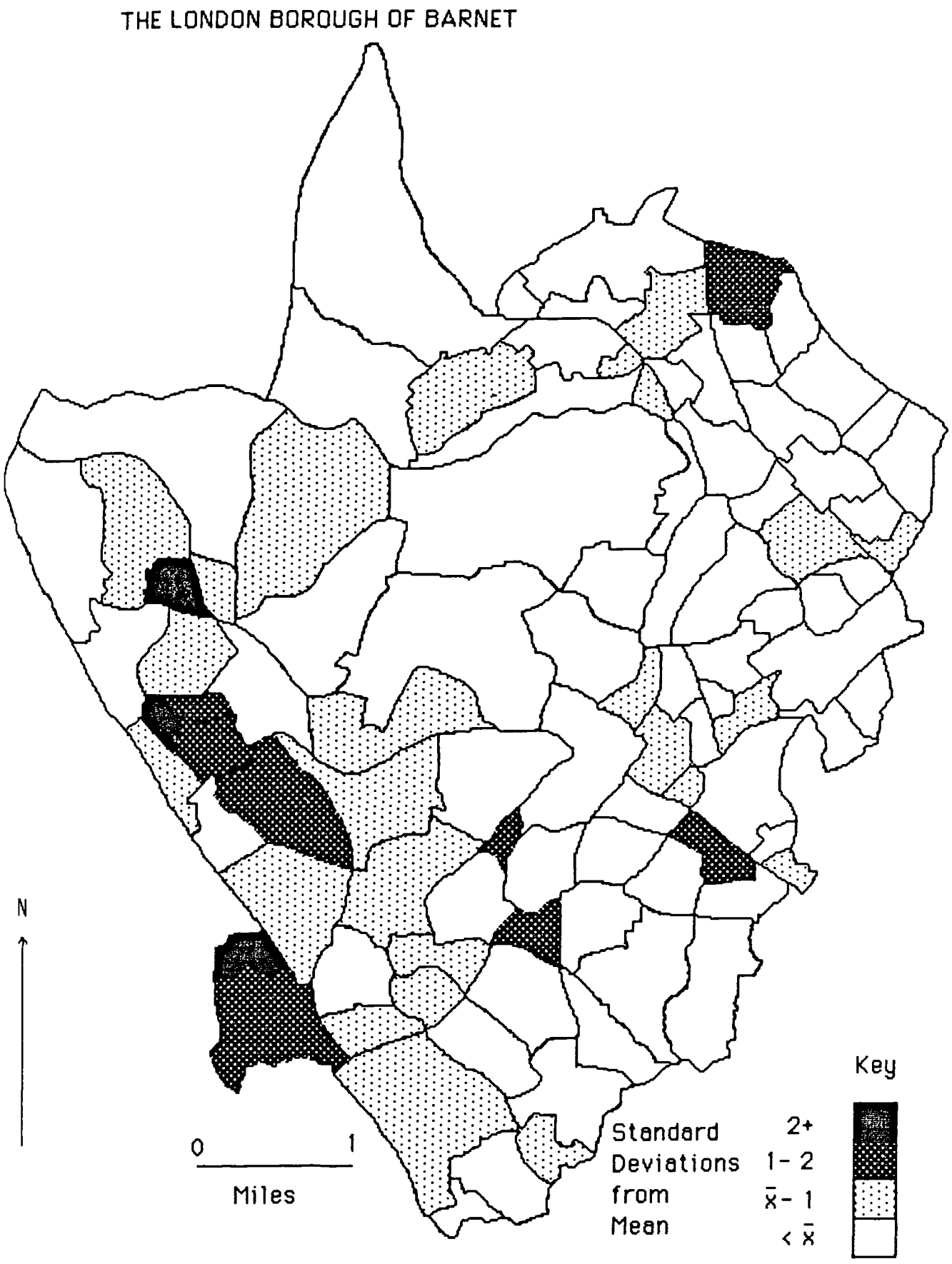


Stroke

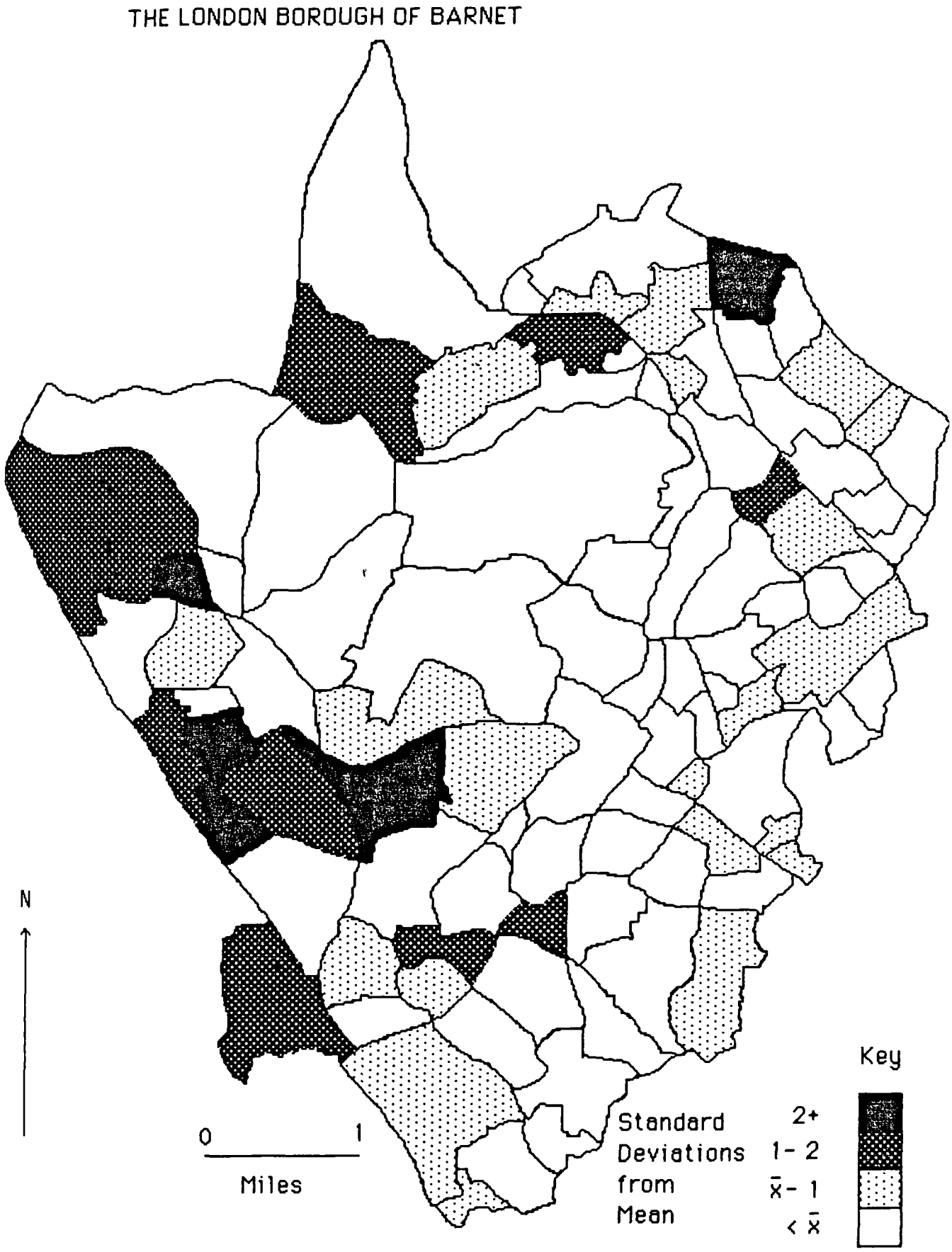


*Source : Original Data

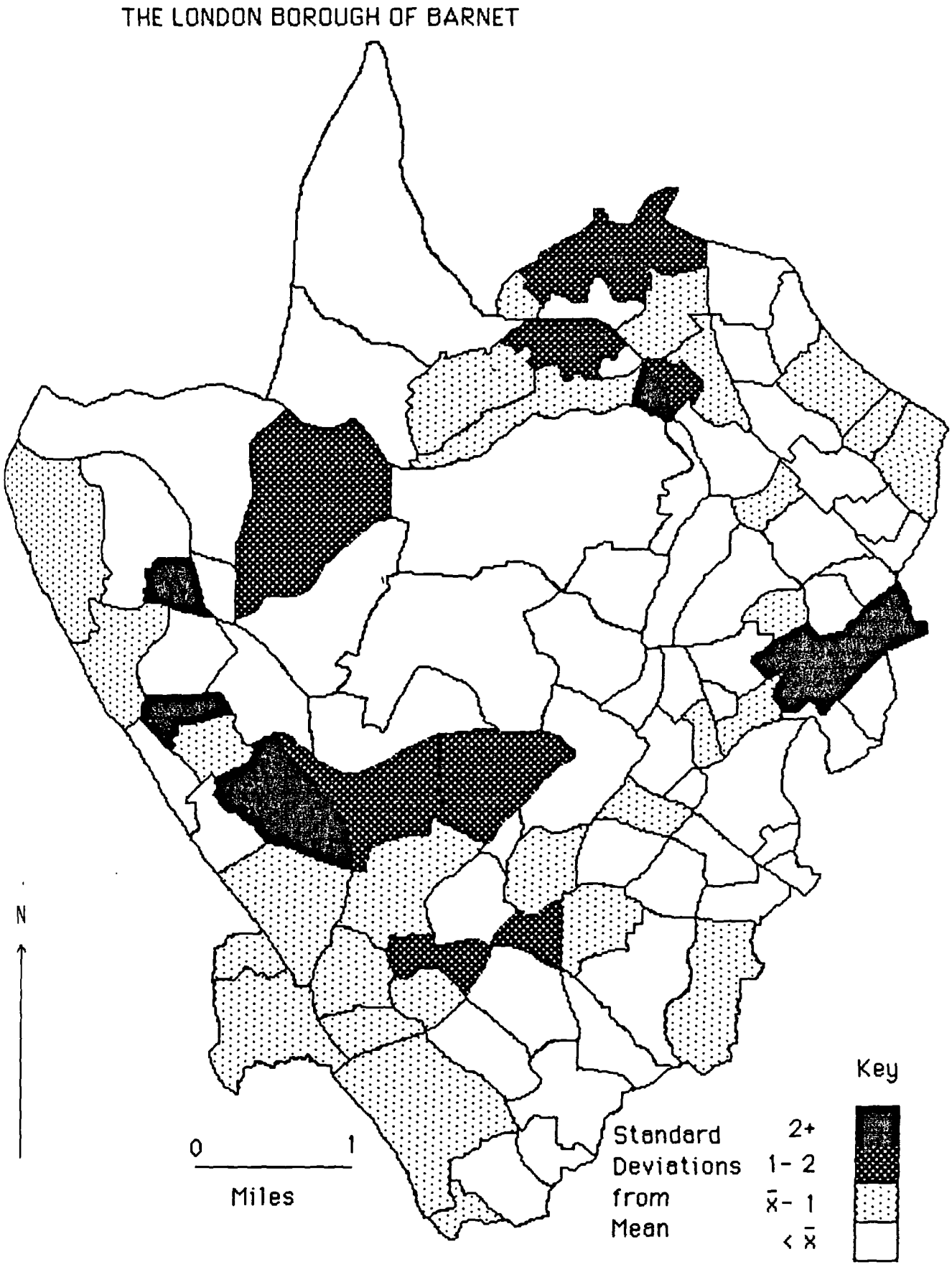
Map 8.11 Standardised Morbidity Ratios for Chest Disorders



Map 8.12: Standardised Morbidity Ratios for Heart Disorders



Map 8.13 Standardised Morbidity Ratios for Stroke Victims



The distribution of stroke victims in Map 8.13 shows some "black" spots in the western areas, but has markedly fewer areas at 2 or more standard deviations away from the mean. In this case an area to the east emerges strongly, an area in Woodhouse ward which has little obvious connection to the socio-demographic structure. Once again, we may question this result, as the original response rate to the survey for Woodhouse ward was so low. In addition, this part of the ward is mainly taken up with Friern Hospital, and has a smaller community population than many other polling districts. The numbers of disabled people are therefore low and the resulting high profile in relation to stroke may well represent a statistical artifact.

While having standardised indeces has enabled a search to begin for "high points" of disabling disease in the Barnet landscape, the actual influence of the standardising variable, age, has yet to be determined. In this case the number of people with a particular category of disorder estimated from the age distribution of the population, can be compared directly with the actual number found in the survey, to see how much of the variation in prevalence age structure can explain. We may regress the predicted value on the actual value to determine which of equations (5) and (6) is most appropriate.

$$Yij = \hat{Yij} \qquad (5)$$

or

$$Yij = a + b\,\hat{Yij} \qquad (6)$$

Where :

Yij is the actual number of people suffering from disorder i in area j

$\hat{Yij}$ is the estimated number of people suffering from disorder i in area j

b is a slope coefficient

The results of the analysis for the three disease types under consideration are presented in Table 8.6. For equation (6) to apply the slope coefficient b needs to be significantly larger than the value 1. While in each case the coefficient is greater than one, a t test to determine whether this is a statistically significant difference, yields t values below the critical level for acceptance. The same is true for the constant value, which in this case is not significantly different from 0. It is clear therefore, that in each case equation (5) provides the best fit. However, the unexplained variation in the data is large, leaving an R^2 value

Table 8.6 : Results of regression analysis of actual numbers with diseases and predicted number, using an age model

Disease	Constant	Coefficient	R^2 - adjusted for D.F.
Heart	-0.6154	1.1088	27.4
t	(-0.67)	(0.60)	
Chest	0.0868	1.0934	21.6
t	(0.09)	(0.45)	
Stroke	-0.159	1.1883	30.3
t	(-0.26)	(1.04)	

Note- t values calculated to test for difference from 1 for Coefficients, and against 0 for constants. Critical level for t = 1.658

Source : Original Data

ranging from 21.6 to 30.3. We may conclude that the larger the proportion of elderly people in an area, the more likely it is that the occurrence of strokes, heart problems, and lung disorders in the area will also be high. The size of residual values suggest however, that other factors will also be of importance.

8.4 The Effect of Generative Factors on General Patterns of Disability

The result of the discussion of processes influencing prevalence of disability in Chapter 6 led to five hypotheses being put forward under the heading of "generative factors". These were as follows :

> Hypothesis One- The prevalence of disability will be high in areas with a relatively large proportion of their residents working in industries which are intrinsically more hazardous than others.
>
> Hypothesis Two- The prevalence of disability will be high in areas having a relatively large proportion of their residents aged over 64.
>
> Hypothesis Three- The prevalence of disability will be high in areas having a relatively large proportion of their residents in semi and unskilled manual occupations.
>
> Hypothesis Four- The prevalence of particular disabling diseases will be high in areas having a relatively large proportion of their residents in ethnic minority groups.
>
> Hypothesis Five- Where high rates of prevalence remain unexplained by other factors, these will be related to high rates of particular disabling diseases with natural environmental aetiologies.

It is clear from preceding discussions that hypotheses relating to personal characteristics within the general area of Generative Factors will be of prime importance. The applicability of Hypotheses 2, 3 and 4 to the Barnet situation are tackled in order.

Hypothesis Two

We have seen that age structure has a part to play in determining something of the pattern observed in a small number of influencial disorder categories. The influence of age structure is now tested on the wider range of prevalence data. Firstly a set of age specific prevalences were derived using the method represented in equation (4). These age specific prevalence rates, presented in Table 8.7, were applied to the total population in each age group living in each polling

Table 8.7 : Age specific disability prevalence rate derived from Outset Survey in Barnet

	Age Group				
	0-14	15-44	45-64	65-74	75+
Disability Prevalence per 1000 population	2.94	2.86	14.6	42.2	104.7

Source : Original Data

Table 8.8 : Results of multiple regression on actual numbers of disabled people by selected generative factors

a) $Y = \underset{(0.08)}{0.46} + \underset{(8.80)*}{2.18}\ \hat{Y}$ $\quad R^2 = 41.7\%$

b) $Y = \underset{(-1.84)*}{-12.4} + \underset{(8.67)*}{2.13}\ \hat{Y} + \underset{(3.60)*}{0.162}\ S1$ $\quad R^2 = 48.1\%$

c) $Y = \underset{(-2.93)*}{-26.7} + \underset{(8.86)*}{2.16}\ \hat{Y} + \underset{(3.80)*}{0.0919}\ S2$ $\quad R^2 = 48.8\%$

d) $Y = \underset{(3.37)*}{27.8} + \underset{(8.87)*}{2.11}\ \hat{Y} - \underset{(-4.47)*}{0.0724}\ S3$ $\quad R^2 = 51.3\%$

e) $Y = \underset{(0.16)}{0.99} + \underset{(7.81)*}{2.22}\ \hat{Y} - \underset{(-0.35)}{0.00123}S4$ $\quad R^2 = 41.1\%$

Where Y is the actual number of disabled people, $\hat{Y}$ is the number estimate using an age structure prevance model, and

S1 is number of people in class IV/V per 1000 population
S2 " IIIM and N "
S3 " I/II "
S4 is the number of people of Pakistan, Asian, or New Commonwealth decent. per 1000 population

All t values for difference from 0.
* Sign. at 95% level

Source : Original Data

district, in the manner of equation (8):

$$Yj = (2.94*A1j + 2.86*A2j + 14.6*A3j + 42.2*A4j + 104.7*A5j)/1000$$

An estimate of the number of disabled people living in each polling district resulting. The distribution of the expected number of disabled people was compared to the actual figures using ordinary least squares regression. The equation which resulted is shown below:

$$Y = 0.46 + 2.18\ \hat{Y}$$

$$(0.08)\ (4.53)*+ \qquad R^2 = 41.7\%$$

+ t for coefficient different from 1.0
* significant at 95 % level.

Where :

Y is the actual number of disabled people found in the survey
$\hat{Y}$ is the number of disabled people estimated from age group prevalence model.

It is clear that age structure is a significant influence on the level of disability experienced within polling districts in Barnet, and that Hypothesis Two can be accepted. However, the slope coefficient is significantly greater than 1.0, and R^2 values are relatively low, which indicate that other factors are at work, forcing up levels of disability to a point where they are not fully determined by age structure. These factors, in relation to an "ecological" framework for analysis, could be other relevant characteristics of the individuals concerned, or "neighbourhood effects".

Hypotheses Three

Hypothesis three suggests that the distribution of skilled and unskilled manual occupational classes may be influencial, low social status being a surrogate measure for many processes which influence probability of disability. When entered into equation (7) with age structure, all three of the occupational class variables had an effect, both in terms of significant coefficients, and in bringing about an increase in the original R^2 value. The results of this analysis are shown in Table 8.8 (b,c,d), the direction of the affect was clear. Levels of disability were lower where there were high proportions of professional and managerial residents. The prevalences went up when either skilled manual or service groups were present in significant numbers, or unskilled workers were present.

The effect on R^2 was more marked with the inclusion of

classes I/II in the equations, raising the R^2 value from 41.7% for the original age model, to 57.3%. In reviewing the occupation class structure of the Borough Maps 8.4 (IIIM and N) and Map 8.5 (IV/V) showed that these two groups overlapped spatial to a far greater degree with each other, than either did with professional and managerial groups. The enhanced influence of class I/II is due to it having a supressing affect on disability prevalence of the same order as the other two groups would have if put into the equation together as one spatial group. Both manual related groups are likely to experience higher rates of disability than those in class I/II. This supports then, the acceptance of Hypothesis three. As higher rates of disability are not restricted to areas with large numbers of semi- and unskilled workers, a more useful Hypothesis from the Barnet point of view would be that "the prevalence of disability will be higher in areas having a relatively low proportion of their residents in professional, managerial occupations".

Hypothesis Four

Hypothesis four suggests that ethnic minority status can also increase the likelihood of one having particular types of disorder. Rickets remain a problem today for Asian women whose customs seldom let them obtain the benefits of the sun in this country, and Sickle Cell Anemia is linked to concentrations of those with African and West Indian origins. There are relatively few concentrations of these racial groups in Barnet. It is unlikely that the effect of these or other particular racially linked disorders would be significant in determining large scale patterns of disability.

Before looking at the global effect of ethnic minority status on patterns of disability, we are able to look at the numbers suffering from the particular racially linked disorders mentioned. Rickets or osteomalacia as current disorders, or as disorders having caused disability in the past, was suffered by only 4 out of the total of 4571 people interviewed. No one was identified as suffering from Sickle-Cell Anemia, while only 2 people suffered from other hereditary Anemias . Anemia as a whole accounted for 60 people, 1.3% of the total number of disabled people interviewed. It is clear therefore, that these particular disorders can play little part in structuring the pattern of disability across Barnet as a whole. Ethnic minority status is included in the analysis, however, to see whether there might be any other processes linked to ethnic minority status, that need to be taken into account.

Ethnic minority status (defined as numbers of residents born in Pakistan, Asia, and New Commonwealth per 1000 residents) was introduced into a regression with the age structure model. The results of this analysis is shown in

Table 8.8 (e). They show that ethnic minority status had no influence over that of age structure, having a slope coefficient not significantly greater than 0. Hypothesis four may in this case be rejected as a major source of patterned disability.

Hypothesis One

We now turn to hypothesis one which concerns the influence of hazardous industries. It has been suggested by Harris (1971) that higher rates of disability identified in her survey could be related to the fact that many more local people work in heavy industry in areas of high prevalence, than do elsewhere. In the Barnet context, the census provides an opportunity to look at the proportion of polling district populations working in industries usually accepted as being more hazardous than others; namely manufacturing and construction. While the statistics do not enable detailed relationships to be drawn between disability and particular forms of manufacturing industry, it can provide a crude indicator of the impact of the industrial composition of residential areas on prevalence.

The number of people from a polling district working in manufacturing or construction industries was expressed as a rate per 1000 economically active in the area, and put into the equation with the number of disabled predicted from age structure. This led to the following equation:

$$Y = -13.70 + 2.75\,\hat{Y} + 0.121\,S5$$

$$(-1.19) \quad (8.55)^{*} \quad (1.44) \qquad R^2 = 42.3\,\%$$

* significant at the 95% level

Where:

Y is the actual number of disabled people found in the survey
$\hat{Y}$ is the number of disabled people estimated from the age group prevalence model
S5 is the number of people in manufacturing and construction per 1000 economically active

The coefficient for the occupational variable is not significantly different from 0, and R^2 is changed from 41.7% to 42.3%. It is clear therefore, that hypothesis one may in this case be rejected as a major source of patterning of disability.

We have looked at generative factors under the model presented in that Chapter 6, itself based on solid theoretical insights. Of the three hypotheses looked at so far under the heading of generative factors, both age

(certainly) and occupational class (saving the restriction due to occupational class being an "ecological" variable) have both been seen to be influencial. Ethnic minority status and employment in manufacturing and construction industries have not been identified as influencial in any large scale way. At present the use of occupational class I/II as a variable along with the age structure model, has increased the value of R^2 to 51.3%. This would seem to indicate there is room for further causal factors to be introduced into the modelling procedure.

8.5 The Influence of "Redistributive" factors on Patterns of Disability

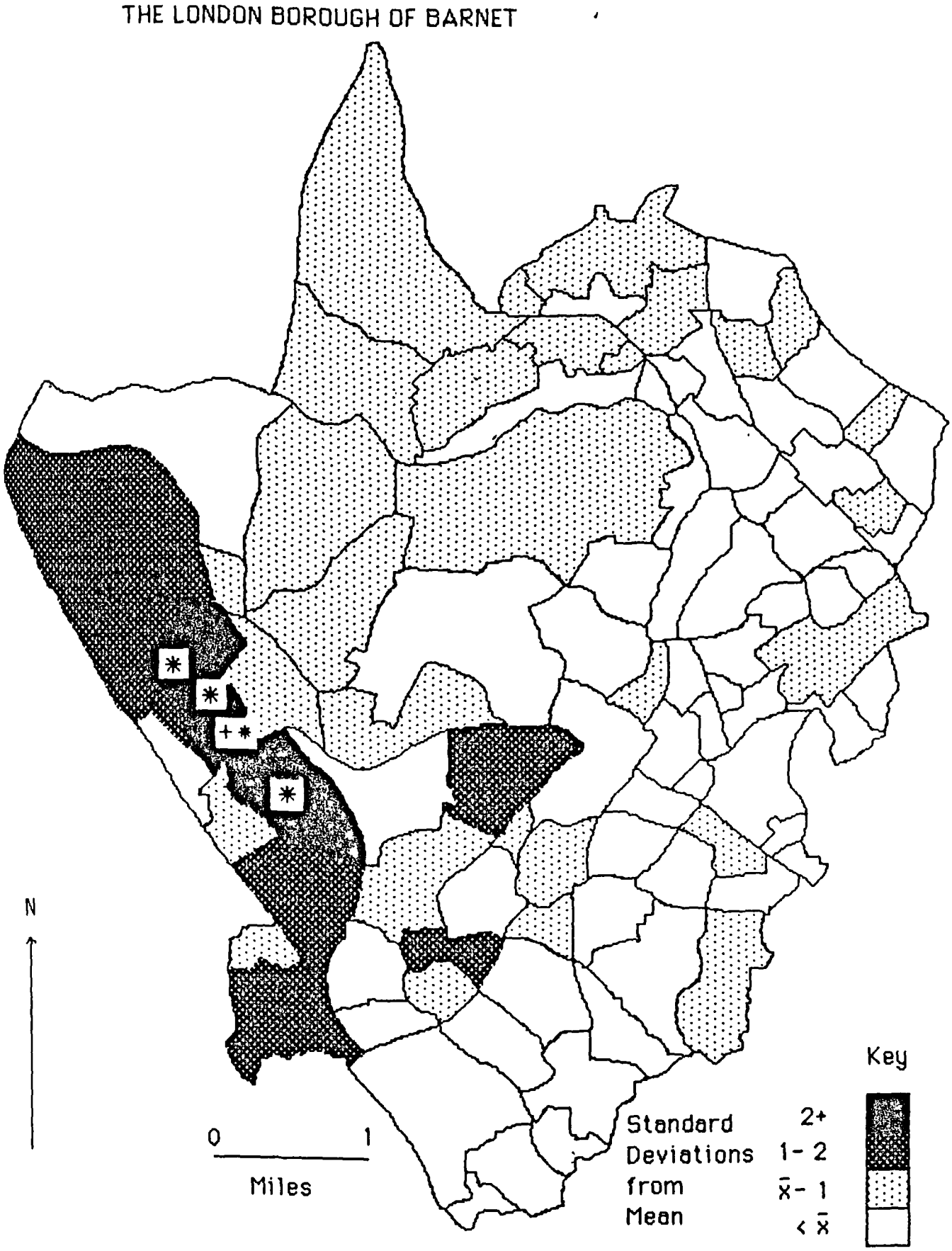
A useful way to approach the role of redistributive factors is through a further analysis of residuals from the models already produced. By using computational techniques now common in relation to exploratory data analysis it is possible to identify areas which have large residual values from the current model. For these areas the model may be predicting levels of disability which are far too high or far to low, effectively leaving them as "outliers" from the main trend of the model. It is also possible to identify those areas whose actual levels of disability prevalence are such that they have a disproportionate influence on the slope coefficients, effectively "pulling" the estimation line towards them or away from them and hampering the general applicability of the model. This may be termed areas exerting "leaverage" on the regression line, and therefore on the slope coefficients (Hoaglin and Welsh,1976).

In the present context the standardised residuals from model "d" in Table 8.8, that involving age structure and the influence of occupational class I/II, are plotted in Map 8.14, those areas having unduly large residuals being starred (*), those having a significant influence through "leaverage" on the model being marked with a cross (+)(A full tabular list of standardised residual scores is presented in Appendix 6).

This shows a bias to the west of the Borough, with polling districts in the west systematically having estimates of prevalence lower than those actually experienced. The large council rented tenure areas of Burnt Oak, and Colindale appear with prevalences of disability significantly higher than predicted by the model. This is in spite of Burnt Oak being identified as a district which has had a significant effect on the regression line, making it steeper than might have been expected from the data on other districts.

In trying to explain the remaining variance in the

Map 8.14 : Standardised Residuals from Model of Disability Prevalence Including Age Structure and Professional Occupational Class



distribution of the prevalence of disability in the Borough, we may consider those hypotheses put forward under the heading of "redistributive factors" in Chapter 6. These were as follows :

> Hypothesis Six- The prevalence of disability will be high in areas where there are located special residential facilities that may attract people with a high risk of disability, such as sheltered housing for the elderly, or small private homes for the elderly, mentally handicapped, or disabled.
>
> Hypothesis Seven- The prevalence of disability will be high in areas having a large proportion of their residents in the council rented sector.
>
> Hypothesis Eight- The prevalence of disability will be high in areas having a large proportion of their residents in housing of low amenity .

Because of the distinct spatial pattern exhibited by council housing in the Barnet area, this variable is brought into the analysis first

Hypothesis Seven

In bringing into the equation the influence of housing tenure, notably the influence of council housing, it is possible to introduce it at the level of the individual. From the Outset Survey it is possible to identify the prevalence of disability among those in council housing. In the same way that age specific prevalences were applied to total populations in age groups and within polling districts to provide expected numbers of disabled, so it can be done for council housing. However, it is possible to derive a joint set of prevalences for age and tenure which allow both to be accounted for directly in the "hard" predictive part of the model. Using data derived from the census on the age of persons living in council accomodation, and Outset Survey data, a prevalence matrix was constructed, and this is shown in Table 8.9 . These prevalences, which show that prevalence increase both with increasing age and council tenure, were applied to population matrices of the same design derived from the census for each polling district.

The comparison of the predicted and the actual levels of disability, with no additional variables in the equation are give below:

$$Y = -4.04 + 1.09\ \hat{Y}t$$
$$(-0.84)\ (0.92)^{+} \qquad R^2 = 58.6\%$$

+ for coefficients significantly different from 1, and neither t value is significant at the 95% level.

Table 8.9 : Age and housing tenure specific prevalence rates derived from Outset Survey in Barnet

	Prevalence per 1000 population Age Group			
	0-14	15-64	65-74	75+
Council Rented Tenure	4.30	16.79	60.92	191.50
Other tenures	2.64	5.04	35.27	82.65

Source : Original Data

Where :

Y is the actual number of people with a disability
$\hat{Y}t$ is the the number of people with a disability estimated from an age structure/housing tenure prevalence model

Here the model is beginning to approximate to a simple regression equation (equation 4) as the slope coefficient is not significantly greater than 1.0 in this case. As the R^2 value has increased with the introduction of council housing as a redistributive factor the model is beginning to provide a good approximation of what is influencing prevalence of disability in Barnet. At this point if one attempts to reinstate occupational class variables back into the model their influence is no longer what is was. As we can see from the following model, the slope coefficient associated with the occupational class variable is not significantly different from 0, and there is no change in the R^2 statistic which remains at 58.6% :

$$Y = 3.69 + 1.05\ \hat{Y}t - 0.02\ S5$$

$$(0.41)\quad (10.46)^*\quad (-1.03)\qquad R^2 = 58.6\ \%$$

* Coefficient significant at 95% level

Where:

Y, and $\hat{Y}t$ are as before
S5 is number of people in occupational class I/II per 1000 population

The fact that there is a strong overlap between the location of occupational classes IIIM and N, and IV/V with council housing has been stated in relation to the residual Map 8.14. This is brought home when one considers there are correlations of 0.824 between council tenure and occupational classes IV/V, and of 0.633 with Classes IIIM and M. Council tenure therefore has a correlation of -0.702 with occupational classes I/II, the variable used in the last equation. Tenure is the more powerful predictor, as it is based on individual survey rather than aggregate census data. Occupational class is removed from the model at this time in favour of council tenure.

The search for additional influential variables moves to the remaining factors mentioned in Hypotheses six and eight in Chapter 6.

Hypotheses Six and Eight

It will be remembered that in these remaining hypotheses it was suggested that the location of specialist

community type facilities such as sheltered accomodation for the elderly, or private small scale residential establishments for the elderly or disabled may increase local rates (Hypothesis Six).

It is worth noting here that in terms of the data collection mechanisms that may be deployed to identify disabled people, these facilities may well be treated in surveys as community facilities, and their residents counted in community prevalence rates. This was certainly the case in the Outset Survey, and this feature needs to be assessed as a result. Secondly, it was suggested that low residential amenity may be linked to high levels of disability, because these areas were generally cheaper to live in and the disabled were generally a financially poor group (Hypothesis Eight).

A number of studies adopted residential amenity indices in surveys relating to health issues (Giggs,1972;Phillips and Williams,1982) and many other factorial ecologies have adopted these types of indeces (Davies and Lewis,1973). Using these studies as guidelines, the following measures were adopted from the census as measures of residential amenity :

1. Number of people sharing one or both of their bath or inside toilet, as a proportion of total persons in permanent households.

2. Number of people living at densities of more than 1.5 per room, as a proportion of total persons in permanent households.

The correlation between the residuals from the mixed age structure/housing tenure equation with residential density and shared basic amenities were -0.027 and -0.192 respectively. Residential density was not significantly associated with the residuals and was not used in further analysis. Shared basic amenities was entered into the equation with the mixed age structure/ housing tenure predictor:

$$Y = -14.0 + 1.09\ \hat{Y}t + 0.001\ S6$$

$$(-1.90)^{*}\ (11.95)^{*}\quad (1.78)^{*}\qquad R^2 = 59.5\%$$

* Coeffi cient significant at 95% level

Where:

Y, and $\hat{Y}t$ are as before
S6 is the number of people sharing one or both of their bath or inside toilet per 1000 population

This produced no significant change to the original age/housing tenure model. While shared basic amenities

had a slope coefficient significantly different from 0 at the 95% level, it added little to the R^2 value, increasing it to 59.5% from the 58.6% produced by the age structure/ housing tenure model alone. Shared basic amenities , was dropped from further analysis as a result.

Finally, a variable was introduced to represent the number of disabled people living in sheltered housing units present in a polling district as determined from the Outset survey. No information was available to the researcher on distinctions between private and public sheltered housing. The following equation was the result:

$$Y = 2.29 + 0.854\,\hat{Y}t + 4.81\ S7$$

$$(0.49)\quad (8.59)^*\quad (4.43)^*\qquad R^2 = 65.3\%$$

* Coefficient significant at the 95% level

Where :

Y, and $\hat{Y}t$ are as before
S7 represents the number of disabled people living in sheltered accomodation

A correlation of the residuals from this model with the two independent variables yielded -0.012 for sheltered housing, and 0.000 for the age/tenure predictor. It is clear that the assumptions of heteroscadasticity have not been violated.

At this point R^2 has been increased to 65.3%. While much has been "explained", the residuals still appear to contain a significant level of systematic variance that we have not been able to explain using our hypotheses. We may compare the residuals from the current model with the variables rejected at earlier stages, to ensure that these variables (and the hypotheses they represent) have not become significant as the model has been refined. The correlations between the residuals and these variables are shown in Table 8.10 Of the correlations, only "shared basic amenities " is found to be significant. If shared basic amenities are put into the model however, the t values show that this variable is now significant, but the R^2 value is not changed significantly:

$$Y = -9.60 + 0.851\,\hat{Y}t + 5.05\ S7 + 0.002\ S6$$

$$(-1.44)\quad (8.78)^*\quad (4.76)^*\quad (2.42)^*\qquad R^2 = 67.0\%$$

* Coefficient significant at 95% level

Table 8.10: Correlation of standardised residuals from final model with variables excluded from analysis previously

Hypothesis	Variable	Correlation with residuals
	Professional/ Managerial Occupation	-0.114
	Ethnic minorities	0.059
	Worker in Manufacturing/ Construction industry	0.090
	People living at 1.5 per room	-0.016
	Shared basic ameneities	0.239*

Source : Original Data

* Significant at 95% level

Where : $\hat{Y}$

Y, and Yt are the same as before
S6 is the number of people sharing one or both of their bath or inside toilet per 1000 population

From the information we have, therefore, we may suggest that a mixed age/housing tenure and sheltered housing variable model is the best model to explain the pattern of disability prevalence in the London Borough of Barnet, and that hypotheses two, six and seven are found to be most influential in this case.

Hypothesis Five

As there remains a substantial amount of unexplained variance, we return to hypothesis five which, as a "generative factor", suggested that any outstanding variance from an explanatory model may be linked to natural environmental causes of disability. These may manifest themselves through higher rates of prevalence of particular diseases which have links to hazardous natural environmental aetiologies.

We may investigate any outstanding influences at the level of disease through an examination of the residuals from the final model. Map 8.15 shows the standardised residuals from the model in terms of their standard deviations from the mean. A striking pattern exists for residuals above one standard deviation, and two standard deviations from the mean. Once again the largest positive residuals (where actual numbers of disabled people are greater than predicted from the model) are found in a band down the western side of the Borough. Burnt Oak, and the southern parts of Edgware and Colindale, emerge most markedly. An "outlier" exists in Hadley in the north-east. Eleven polling districts are found to have residuals above one standard deviation from the mean. The pattern of disease for these polling districts may be compared with that for the remaining polling districts, to determine if the disease pattern is significantly different. This may indicate the operation of localised natural environmental factors.

The following disorder categories were used to examine the potential differences between polling districts; disorders of the circulatory system, the lungs, the heart, strokes, and sight. The percentage of the disabled in each polling district suffering a disorder in each category were compared using analysis of variance. The comparison was carried out for the group of districts having residuals of over one standard deviation and all other districts. The mean percentage suffering, the standard deviations and F statistics are shown in Table 8.11. For none of the disease categories are the mean percentage for the "high residual" polling districts significantly different from that of the general body of

Map 8.15 : Standardised residuals from age/housing tenure Model

THE LONDON BOROUGH OF BARNET

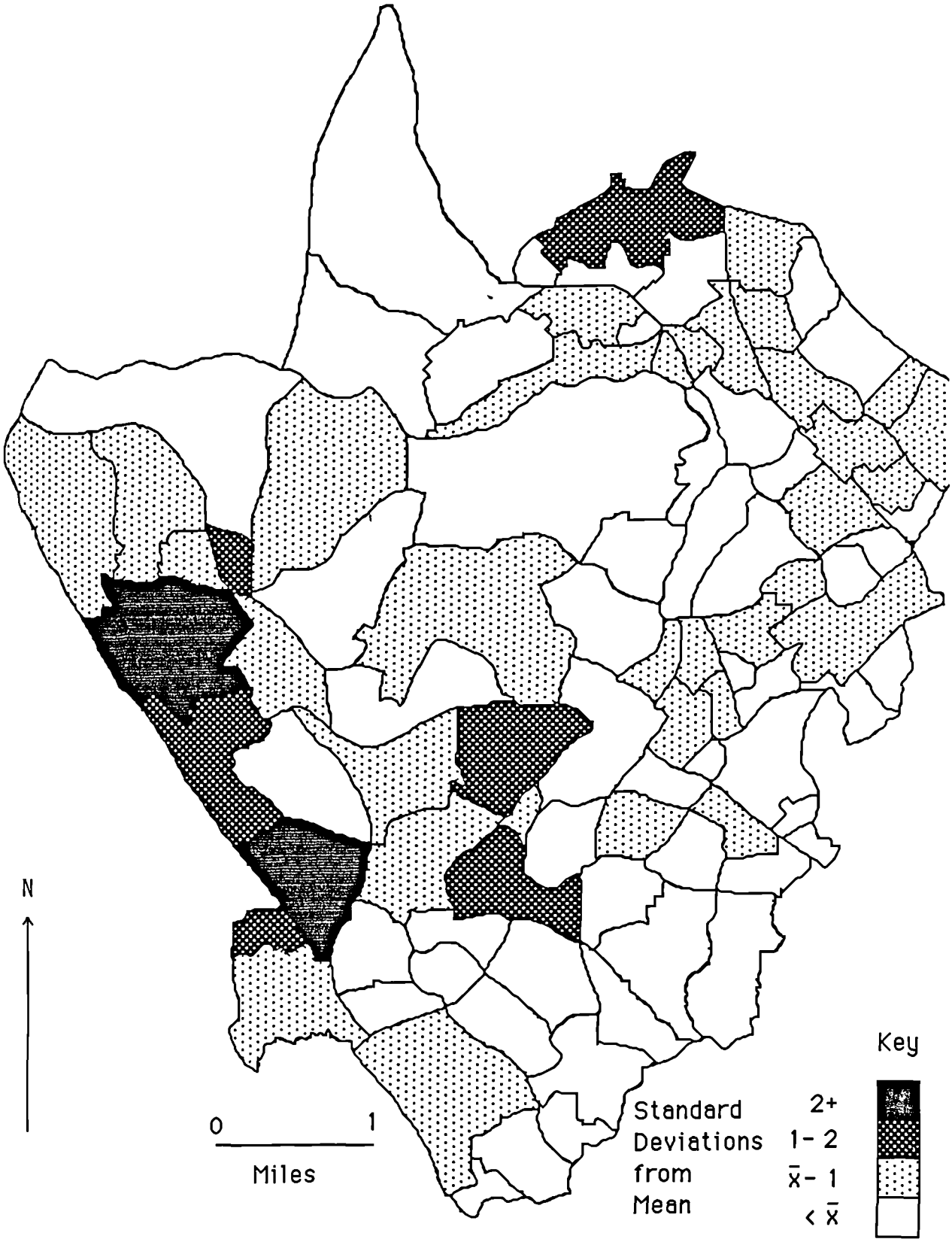


Table 8.11 : Analysis of variance for disorders suffered in polling districts above and below +1 standard deviations from the mean for residuals

Disorder	Polling District Category	Mean	S.D.	F*
Circulatory System	+1 S.D.	2.503	0.855	1.50
	Below 1 S.D.	2.182	0.405	
Lungs	+1 S.D.	2.395	0.949	0.26
	Below 1 S.D.	2.545	0.686	
Strokes	+1 S.D.	2.453	0.990	0.00
	Below 1 S.D.	2.445	0.662	
Heart	+1 S.D.	2.488	0.891	1.22
	Below 1 S.D.	2.190	0.600	
Sight	+1 S.D.	15.460	10.350	0.04
	Below 1 S.D.	16.12	4.63	

Source : Original Data

* No values of F significant at 95% level

districts. It would appear from the data therefore, that a different structure of disabling disease is not the cause of the high residual values in these districts. We do not have any evidence that natural environmental hazard plays a part in explaining deviations from the explanatory model proposed. Hypothesis five may be rejected in this case.

What then is the cause of the deviation in these polling districts? One explanation is that these polling districts contain a special combination of all the factors that may increase the prevalence of disability in an area. Where individual variables are not found at levels high enough to be revealed as significant in a Borough wide analysis, they may be found in combination in particular areas to cause an unexpectedly high prevalence. A similar analysis as that carried out on disorders may be undertaken, this time using the variables representing the hypotheses put forward earlier. The results of the analysis are shown in Table 8.12, in this case population aged over 64 being divided into 65-74, and 75+.

Significant F values were found for population aged over 74, occupational class, and those in council tenure. It is also interesting to note that the polling districts with the largest residuals from the final model, also have significantly larger proportions of their populations in the "severely disabled" category than in other districts. It would seem therefore, that local combinations of large proportions of very elderly people, people of skilled and unskilled manual and service occupational classes, and people in council rented tenure can lead to greater than expected levels disability.

8.6 Conclusion

Dwelling for a moment on the hypotheses put forward in Chapter 6, a number have proved to be supportable. In relation to "generative" factors both age structure, and occupational class were found to be positively related to prevalence of disability. As proportions of elderly people or people of manual occupational class increased in an area the level of disability rose. The proportion of the population of ethnic minority status, and numbers working in manufacturing/construction industries, were not seen to be a significant factors.

The introduction of council housing tenure as an example of a "redistributive factor" leads to measures of occupational class becoming redundent in the analysis, due to the spatial segregation of occupational classes into different housing tenures. The measures of residential ameneity chosen did not have an influence. This is understandable in the Barnet case, with relatively low levels of poor amenity housing being

Table 8.12 : Analysis of variance for influential variables in polling districts above and below +1 standard deviation from the mean for residuals

Disorder	Polling District Category	Mean	S.D.	F
Percentage aged 65-74	+1 S.D.	10.40	1.89	0.06
	Below 1 S.D.	10.54	1.35	
Percentage aged	+1 S.D.	5.97	1.83	8.56*
	Below 1 S.D.	7.62	1.11	
Percentage in classes I/II	+1 S.D.	37.13	15.62	5.08*
	Below 1 S.D.	25.71	17.62	
Percentage in classes IIIM & N	+1 S.D.	29.32	11.14	3.01*
	Below 1 S.D.	35.40	9.19	
Percentage in classes IV/V	+1 S.D.	8.20	5.75	3.01*
	Below 1 S.D.	11.51	7.50	
Percentage in manufacture/const.	+1 S.D.	10.50	3.58	0.23
	Below 1 S.D.	9.97	2.37	
Percentage in ethnic minorities	+1 S.D.	4.14	2.93	0.49
	Below 1 S.D.	4.86	5.07	
Percentage with shared basic amen.	+1 S.D.			
	Below 1 S.D.			
Percentage living at +1.5 per room	+1 S.D.	9.80	11.18	0.58
	Below 1 S.D.	12.42	5.71	
Percentage in council tenure	+1 S.D.	15.55	20.28	5.42*
	Below 1 S.D.	32.44	37.38	
Percentage "severely disabled"	+1 S.D.	1.14	1.46	5.48*
	Below 1 S.D.	2.30	2.11	

Source : Original Data
* Coefficient significant at 95% level

present. Finally, the introduction of a variable to represent one of the more accessible examples of special residential facilities (referred to in Chapter 5 as planned concentrations) in the form of sheltered housing for the elderly, was found to be influential. The significance of this variable demonstrates the influence on localised prevalence rates that such "specialised" facilities can have.

Significant unexplained variance remained from the final model, which had an R^2 value of 65.3%. A hypothesis relating to the role of localised environmental hazards could not help explain the major deviations from the model. The very localised concentration of characteristics thought to be related to disability has been indicated as the process by which such "high spots" can be explained.

In the next section the final element of the hierarchy, handicap, and the factors that influence spatial variation in its prevalence are examined, while the implications of the studies findings for the social geography of handicap are discussed in Chapter 10.

CHAPTER 9

THE SOCIAL GEOGRAPHY OF HANDICAP

9.1 Introduction

In Chapter 6 a conceptual model was developed in which an observed pattern of disability could be regarded as the product of the operation of generative processes at the level of disease and impairment, intervention factors there and at the level of disability, and redistributive factors at the level of disability. It was suggested that from this spatial distribution of people with disabilities another pattern would emerge that related to the level of handicap experienced by those with disabilities. Exactly what form that pattern of handicap would take was dependent not only on the inherent difficulties faced by the individuals making up that pattern of disability, but also on the response of society to those difficulties, and on the spatial aspects of that response.

The important role of society's responses in relation to the state of handicap has been discussed in Chapter 1. It has been argued that within our society, intervention factors, such as statutory services providing special help for people with disabilities, play a major role in relieving the difficulties those people face, and therefore in helping to avoid the role loss they may suffer as a result of their disability. It has also been argued that legislation underpinning such services has not always been concerned with the alieviation of needs, objectively assessed, but instead has been concerned with bridging a gap between what may be needed, and what level of provision is acceptable and "economically rational" within the dominant ideology of capitalism. Legislation does not then offer a strong set of integrated support systems that are linked to a well defined and enforcable idea of services as of right. The practical outcome of this has been the fact that a good deal of room exists for Local Authorities and Health Authorities to determine what is needed in their area, and as a result there has been much scope for spatial variation in the quantity and quality of help available across the country. In Chapter 3 an analysis has been presented of the spatial variation of a number of services commonly made use of by people with disabilities, and the fact that these do not relate to crude patterns of disability prevalence in any logical way.

As we have seen in Chapter 3, much of the responsibility for personal care of people with disabilities lies with the Local Authority Social Services Department. Services have to find mechanisms for translating people's difficulties into a need for service packages that they offer. This is done by drawing up eligibility criteria for professionals to use in assessment, or in a broader planning context, by carrying out surveys to establish patterns of need for resource allocation. The establishment of the need for services is not

unproblematic. Bradshaw (1972) has suggest four types of need; felt need, expressed need, normative need, and comparative need, the first two relating to potential consumers of services, the second two being mainly associated with professional and administrative coordination of services. In tackling the problem of identifying the need for services across their area, Social Services Department planners and managers may adopt concepts of normative or comparative need into their criteria for eligibility.

"Normative" and "Comparative" needs as defined by professionals, administrators, or other experts may be used to help overcome reluctance on the part of deserving citizens to claim a service they did not express an entitlement to. However there are problems in deciding who are the experts in any particular service context, and opinions of different professionals on what service should be provided are often in conflict, even over the same case. The opinions of professionals and administrators can also be structured by an awareness of resource limitations, and be applied as a means of rationing services rather than responding to identified needs. In the case of service for people with disabilities the DHSS view has always favoured the view that needs should be defined locally, and should be interpreted in the light of local resource availability (DHSS,1971). They themselves issue no guidelines on service eligibility standards. Under the provisions of the Chronically Sick and Disabled Persons Act (1970) eligibility for a range of services provided by Social Services Departments requires only that the person satisfies the criteria layed down in the National Assistance Act 1948, Section 29, namely people who are :

"...deaf or dumb and other persons who are substantially and permanently handicapped by illness, injury, or congenital deformity or such other disabilities as may be prescribed by the Minister"

Research has not tended to provide a widely based assessment of need in local areas. Where notable studies have been made of Local Authority welfare provision, these have normally been carried out at the inter-authority scale, with indicators of need and provision being necessarily aggregate and scale specific. Pinch (1979) in his analysis of social services responses to the problems of the elderly has pointed out that other more detailed approaches to provision are required.

> "Much more knowledge is therefore required before such analyses can be used to provide firm guidelines for policies designed to achieve greater degrees of territorial justice. Of particular importance is the extent to which social need indicators accurately reflect conditions experienced (and perceived) by the inhabitants of areas and the extent to which those in greatest need actually receive services.... In this context there is considerable potential for geographical analysis of the intra-authority

distribution of services rather than inter-authority patterns which have hitherto formed the major focus of research."

Pinch (1979,pp 219)

An appreciation of the perceived needs of clients may be approached through Bradshaw's other two categories of need, namely "felt" and "expressed" need. In felt need clients are asked what they feel their needs are, irrespective of whether they have taken steps to acquire services. In expressed need there is an added criteria that the person has made his need known by applying for a service, or lobbying for its creation. The concept of felt need as a practical measure has been criticised in three respects (Clayton,1983).Firstly the way the service is referred to by interviewers, or the names used by services to describe elements of their provision can influence responses, with names or descriptions that cunjure up negative images for the individual generating responses of no felt need. Secondly the validity of posing a hypothetical future service option to a person without the cost implications of the option being made clear has been questioned. Where people count the costs, in the widest sense, of receiving a service, the response can be different from that given first. Finally Clayton suggests that a response from an individual along the lines that they would "like" a service, does not necessarily mean that even the person themselves believes they need that service to improve their quality of life.

In this final chapter an attempt is made to analyse patterns of provision within the London Borough of Barnet and to relate these to patterns of the need for services as reported by people with disabilities themselves. While there are a number of difficulties in using felt and expressed need, there is a need to tackle the problem of service provision at the intra-urban scale, and approaching individuals is the best method available at present. The extent to which the concept of "Territorial Social Justice" applies in the provision of services in the Borough is assessed, and some discussion made of the characteristics of any deviations from the pattern implied by territorial justice. The implications for the social geography of disability and handicap are noted.

9.2 Data Sources and the Concept of Territorial Social Justice

The data source for the analysis presented here is the survey of people with disabilities carried out by the charity Outset in 1979-80. This has been detailed in Chapter 7 and formed the basis for analysis of patterns of disability prevalence presented in Chapter 8. In the survey, people with disabilities were asked what disorders they suffered from, and what dificulties they had in key aspects of daily living. After being asked to consider their current difficulties, people were then asked which services from a comprehensive list they were

in receipt of to help them overcome these difficulties, which of these they were disatisfied with if any, and which services they felt they required but which they did not at the time receive. Interviewers received training to develop a broad knowledge of what was involved in the services mentioned to inform those who were not familiar with them. The responses were recorded using the "Agerholm Handicap Profile" (shown in Appendix 2). The information for all 4571 people interviewed was computerised as part of this research exercise.

The respondents in the current survey exhibited both felt and expressed need. Those who responded that they received a service on any particular kind, the response represented an expressed need, the client having had to have actively sought the service, or participated in it being introduced to them. For those who said that they wanted a service they currently did not receive, their response was one of "felt need". Within the framework of the survey there was no way of telling whether these people had translated their wish into an expressed need by having contacted service providers before the survey had contacted them. However, the seriousness of their felt need may be gauged through the responses of people when asked if their forms could be sent to social services for further review of their needs. If the person did not wish this to happen the section of the form containing the clients name and address were removed. Of 4571 people being interviewed, only 149 (3%) did not wish their form to be forwarded.

Information from this source can therefore, be used to compare actual provision of elements of service with need for services at the level of the individual, and at an aggregated level for sub-areas within the Borough. The potential is there to side-step the problems experienced in larger scale inter-authority analyses that rely on aggregate data for provision and indicators of need. As Pinch pointed out these include the problem of how valid is the relationship between aggregate social need indicators and actual needs experienced, and that of whether those with the greatest needs receive services.

Reference has been made to the fact that there are a number of concepts of need that require attention if the concept of Territorial Social Justice is itself to be tackled meaningfully. Under the concept of Territorial Justice put forward by Davies (1968), there needs to be a direct correspondence between need and provision, with both being measured in the same way. We should see therefore :

> "...a perfect positive correlation between standards of provision and the index measuring the relative needs of each area for the service- the relative inequality of the standards indices being the same as that of the index of relative needs."
>
> Davies(1968,pp39)

However, it is often the case that the concepts of need adopted by planners and administrators of services are at odds with the concepts of need of most relevance to their prospective client group. A pattern of service delivery which is not exactly in line with concepts of Territorial Social Justice does not necessarily mean the pattern of handicap experienced will necessarily be different from the pattern of disability observed. While provision may not fully reflect the total demand for services in each area, its distribution may still remain equitable. This is achieved if unfulfilled need for services is distributed in proportion to the size of the disabled population in each area. If not equitable the distribution of unfulfilled service demand may at least be rational, relating to operational policies which may set priorities for service delivery. These priorities may be in terms of giving priority of resource allocation to particular areas, particular types of services, or to particular sorts of clients, such as those with more severe disabilities, or with particular difficulties.

If however, the distribution of unfulfilled need is not equitable, nor rational in respect of operational priorities, it is necessary that the question "who wins and who loses from this distribution of provision?" is asked. It is these questions that form the basis for this part of the study.

9.3 Levels of Provision of Services in Barnet

The survey carried out by Outset in the London Borough of Barnet was commissioned by the Social Services Department to satisfy their obligation under Section 1.1 of the CSDP Act (1970) to identify all those in their area who would potentially need the services they were empowered to provide. Many of the questions relating to services were related to likely provision by Social Services under that Act. The Act lays down in Section 2 the following elements of service :

a) Practical assistance in the home
b) Provision of or assistance with recreation facilities including wireless T.V., library services and other similar services
c) Provision of recreation facilities outside the home or help to take advantage of education facilities.
d) Help with travel to make use of these services
e) Assisting with adaptations in the home *
f) Facilitating the taking of holidays
g) Provision of meals at home or elsewhere
h) Provision of or assistance in obtaining a telephone or special equipment to help them use one

* Guidance was amended in 1978 to shift ultimate responsibility for adaptations in the public sector to District Housing Authorities. Even in this case Social Services Departments usually retained responsibility for assessment and recommendation for adaptations to the Housing Department.

In terms of actual elements of service, "practical help in the home" usually translates into the provision of Home Helps, or the provision of special aids to daily living (raised toilet seats, reaching and gripping aids etc.) through Occupational Therapy Sections. Adaptations include structural alterations to homes such as the addition of ramps, and rails, or stair lifts, while help with telephones could mean covering installation charges or even continuing rental charges.

In 1980 at the time that this survey was carried out, Barnet had a healthy performance in terms of its provision when compared to other Local Authorities. Figures published by the Chartered Institute of Public Finance and Accountancy showed that, in financial terms, Barnet spent more than the majority of it's Outer London colleagues on Adaptations, and Telephone installation. Its performance of 0.4 installations per 1000 population was above the national average of 0.3% in respect of telephones. In relation to home adaptations Barnet did even better, coming second in the Outer London Region with an installation rate of 2.2 per 1000 residents, compared to a national average of 1.3. Its expenditure per 1000 residents was some £424, compared to a national average of £139 (*Disability Alliance,1980*).

While Social Services are a major provider of services in the Barnet area, it is well to remember that much help and support comes from informal family and community sources. Table 9.1 shows the items of personal help and services from Section IIIA of the Agerholm Handicap Profile that were being received by 10% or more of those interviewed. Those aspects of help normally maintained through these family and community sources were found to be widely available, for example help with shopping, collection of pensions and medicines, house and garden maintenance, and use of occasional transport. The table also indicates the importance of General Practitioner services in the lives of disabled people, especially the elderly.

The most common services related to mainline Social Services functions were those relating to advice services, of which advice on cash benefits and rebates is the greatest (33% of the total interviewed). The provision of Home Helps was the next largest identifiable Social Services Provision, received by 21% of those interviewed. Table 9.2 shows items of equipment people were in receipt of, again selecting those items involving 10% or more of those interviewed. Here the possession of a telephone is wide spread among disabled people. The fact that Social Service had helped with a relatively small number of installations in 1980 would indicate that many of these were privately installed and maintained.

The provision of mobility aids outside the home were the most commonly available specialist piece of equipment, these being a main province of Social Services Occupational Therapy Departments, although there would be

Table 9.1 : Items of Personal Help and Service received by 10% or more of those interviewed

Item	No. people who have service	As % of all interviewed
Shopping	2802	61.3
Contact with G.P.	2735	59.8
Collection of medicines	2081	45.5
" pensions	2051	44.9
House maintenance	1928	42.1
Regular help with foot care	1612	35.2
Visitors	1604	35.1
Advice on cash benefits & rebates	1529	33.4
Occasional transport	1473	32.2
Garden maintenance	1307	28.6
Meals on wheels	1045	22.9
Home Help	946	20.7
Social outings	945	20.7
Advice on own disability	944	20.7
Advice on on aids & equipment	794	17.3
Chiropody at clinic	682	14.9
Advice on services	674	14.7
Library services	639	13.9
District Nurse	564	12.3
Regular help with dressing	525	11.5

Source : Original Data

Table 9.2 : Items of Equipment received by 10% or more of those interviewed

Item	No. people who have services	As % of all interviewed
Telephone telephone adaptation	2869	62.8
Household heating	2615	57.2
Mobility aid outside the house	1924	42.1
Bath/Shower aid or modification	1322	28.9
Household laundry equipment	910	19.9
Car or van	842	18.4
Ramps and rails inside house	798	17.5
Mobility aid inside the house	653	14.3
Parking badge scheme	653	14.3

Source : Original Data

a small overlap with Health Authority Physiotherapy Department provision. From the evidence in the survey on mobility characteristics of the disabled population, there were some 3851 people who had some degree of difficulty in their mobility, 2066 of these being reliant on an aid of some kind. The provision of structural aids and adaptations to help with mobility problems is also a major area of provision, with 18% of people interviewed being reliant on ramps and rails inside the house. Many of those catered for in this way are wheelchair users, 388 of whom were identified in the survey.

Turning now to those services which people felt that they needed, but which they did not at present receive, Table 9.3 and 9.4 show the items of personal help, and equipment that were wanted by 5% or more of the total number of people interviewed. While high on the list of services currently received, advice service continue to feature high on Table 9.3 of personal services required. The largest demand for advice services was on cash benefits and rebates. The need for community related services such as house and garden maintenance remain on the list as having significant numbers still in need of them, while 5% of those interviewed still felt their contact with their G.P. was inadequate. The importance of continuing foot care, especially among the elderly is reflected in a large number of unfulfilled needs for Chiropody in the home or, for personal help with foot care (cutting toe-nails' etc.). The number of people still in need of Home Helps is approximately 30% of the number already in receipt, indicating a substantial unfulfilled need for this service.

Under the heading of equipment, the main demands were almost exclusively for Social Services related equipment (as opposed to Health Authority). Shower or bath aids or modifications were most in demand, with aids for reaching being second with a long gap in between.

Table 9.5 summarises the overall position in respect of a selection of services relating to Social Services provision under the CSDP Act. This shows clearly that provision is high in respect of overall coverage of the disabled population as one would expect from Barnet's "league table" positions in 1980. The table shows however, that actual provision ranges from 92% of the potential demand for telephone installation or adaptation, running down to only 45% among aids for reaching, demand being higher than current provision in this case.

9.4 Territorial Social Justice among Services in Barnet

In Davies' concept of Territorial Social Justice, a just distribution of provision for disabled people living in polling districts within Barnet, would be such that it correlated exactly with indicators of the need for services in each polling district. In this case we may

9.3 : Items of Help and Personal Service "wanted" by 5% or more of those interviewed

Item	No. wanting item	As % total responding to item	As % total interviewed
Advice on cash benefits, rebates	683	30.9	14.9
Garden maintenance	579	30.7	12.7
House maintenance	528	83.0	11.6
Advice on aids and equipment	523	39.7	11.4
Chiropody at home	507	40.0	11.1
Advice on services	482	57.3	10.5
Advice on holidays	426	47.3	9.3
Home Help	404	29.9	8.8
Help with foot care	301	17.2	6.6
Social outings	301	24.2	6.6
Library service	296	31.7	6.5
Occasional transport	296	16.7	6.5
Better contact with G.P.	261	8.7	5.7

Source : Original Data'

9.4 : Items of Equipment "wanted" by 5% or more of those interviewed

Item	No. wanting item	As % total responding to item	As % total interviewed
Bath/shower aid or modification	605	34.8	13.2
Aids for reaching	375	55.0	8.2
Ramps and rails inside the house	327	30.5	7.1
Cash help for mobility	300	54.3	6.6
Parking badge scheme	297	31.6	6.5
Ramps and rails outside the house	250	43.9	5.5
Telephone or adaptation	240	7.9	5.5
Toilet aids or modification	229	33.8	5.0

Source : Original Data

Table 9.5 : Items of Personal Help and Equipment received and wanted by those interviewed- Key Social Services items

Item	No. of people Has	Wants	Has as % total need (Has+Wants)
Telephone or adaptation	2869	240	92.3
Advice on cash benefits,rebates	1529	683	69.1
Bath/Shower aids or modification	1322	605	68.6
Home Help	946	404	70.1
Toilet aids or modification	448	229	66.2
Aids for reaching	307	375	45.0

Source : Original Data

progress to a direct comparison of the total demand for the services shown in Table 9.5, both fulfilled and unfulfilled, and the actual provision in each area. Figures 9.1 to 9.6 provide plots of total numbers needing each service (has and wants), against the number in receipt of the service (has) for each of the 98 polling districts in Barnet (A full list is presented in Appendix 7). The definition of those in receipt of the service includes those people who received the service, but who were disatisfied with it in some way. The definition takes, therefore, no account of the quality of the service provision. It will be remembered that we put forward an hypothesis in Chapter 6 which proposed :

"HYPOTHESIS NINE- Patterns of provision of personal social services will directly reflect patterns of need for these services".

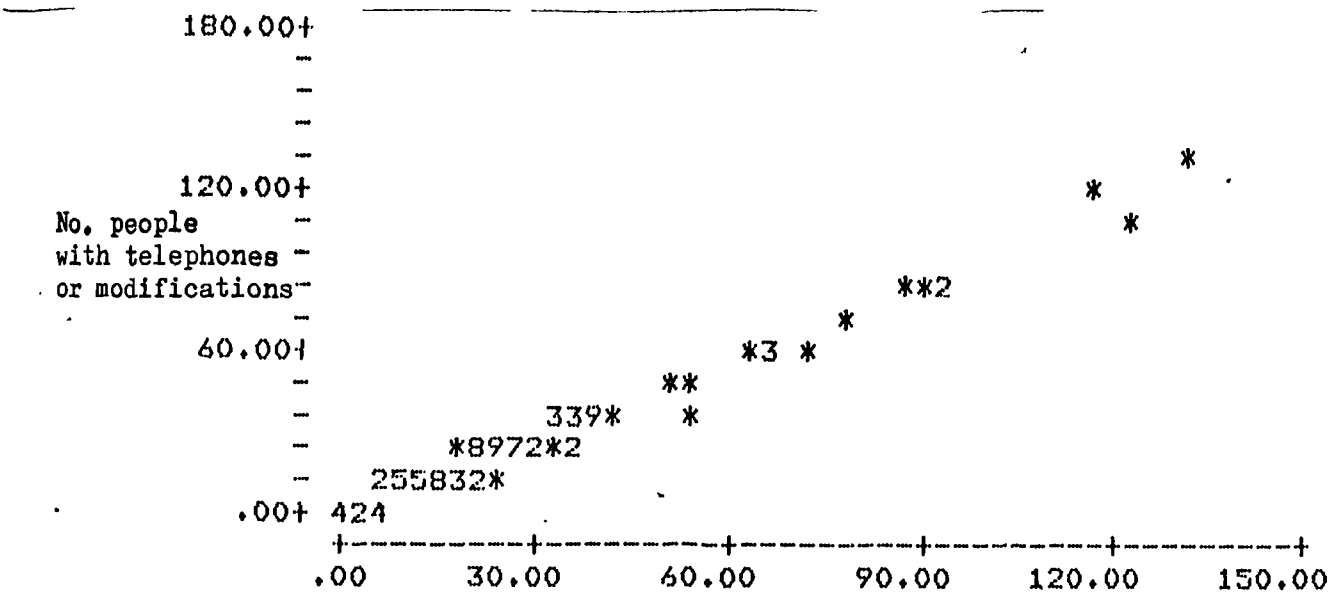
The data from the Barnet survey tended to support this hypothesis. In all cases a strong linear relationship is observed, showing that some level of correspondence exists between total felt need and provision. In theory the relationship between need and provision should be exact correspondence if a territorially just solution is in effect, an example of which is shown in example 'a' in Figure 9.7. The visual impression is however, that the linear trend is not a "one-to-one" relationship, except perhaps in the case of advice on cash benefits, and that the relationship may be more that of example 'b' in Figure 9.7. We may however, provide a more rigorous comparison of the numbers in need of the service with the number in receipt of the service using simple regression. If we apply equation 9 to each of the six services in turn, should a territorially just distribution of any service exist we would expect an intercept insignificantly different from 0, and a slope coefficient insignificantly different from 1.

$$Pj = a + b\,Nj + e \qquad (9)$$

Where: Nj is the total number in need of the service (those who have it+those who dont have it but require it) in polling district j.
Pj is the total number of people who currently have the service in polling district j.
a is the intercept term
b is the slope coefficient of the relationship between Pj and Nj
e is the residual

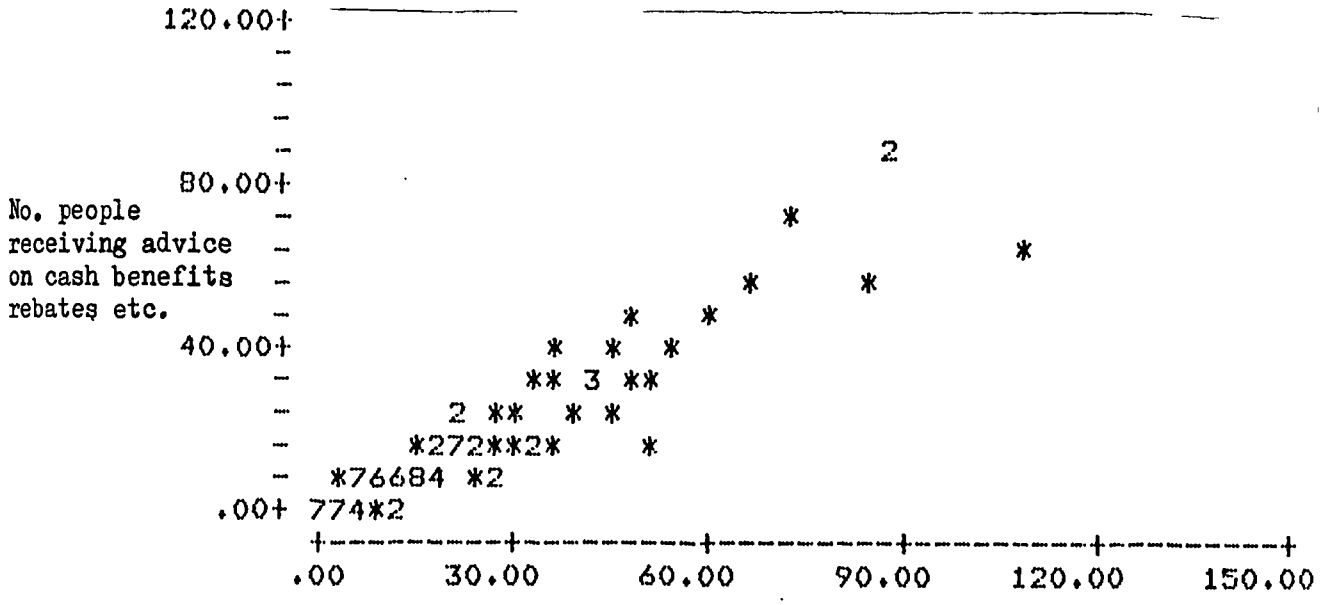
Table 9.6 provides a summary of the simple regression comparison between P and N for the six service elements identified previously. In each case t statistics reveal the fact that slope coefficients are significantly less that the value of 1, a value which would represent a territorially just pattern of provision. In the cases of advice on cash benefits, Home Helps, bath/shower and toilet aids or modifications, and telephone installations, the pattern of need explains a great deal of the variation in level of provision. This can be seen

Figure 9.1 : Relationship between provision of and need for telephones or telephone adaptations for polling districts in Barnet



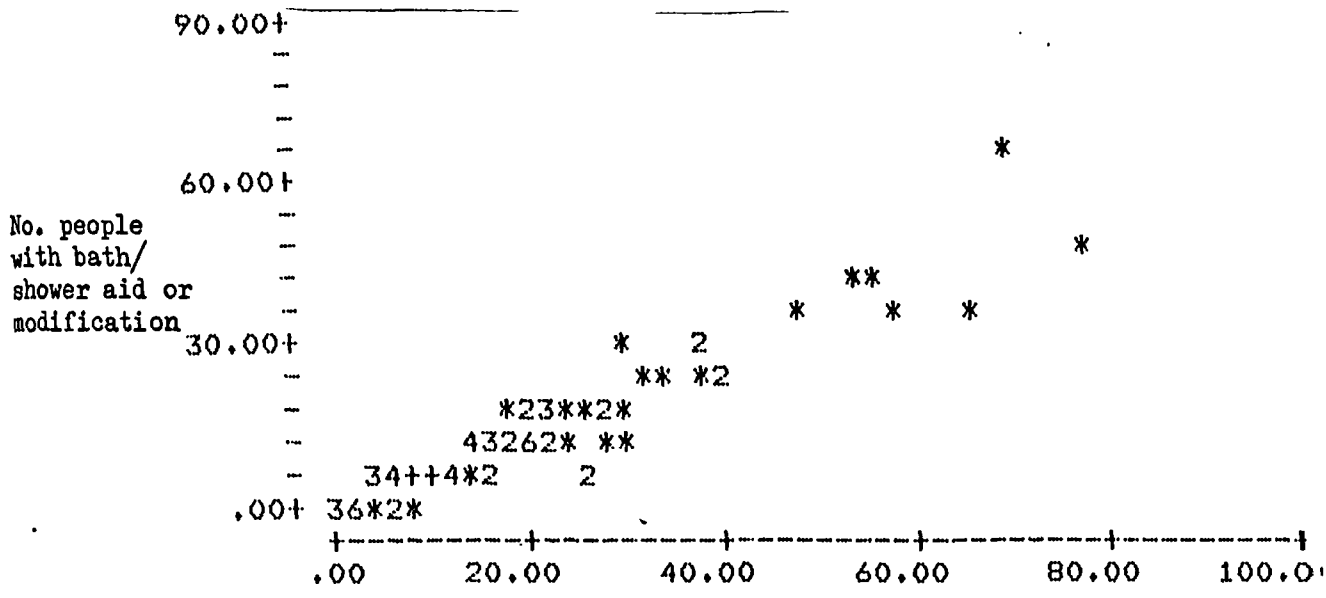
Source : Original Data

Figure 9.2 : Relationship between provision of and need for advice on cash benefits, rebates for polling districts in Barnet



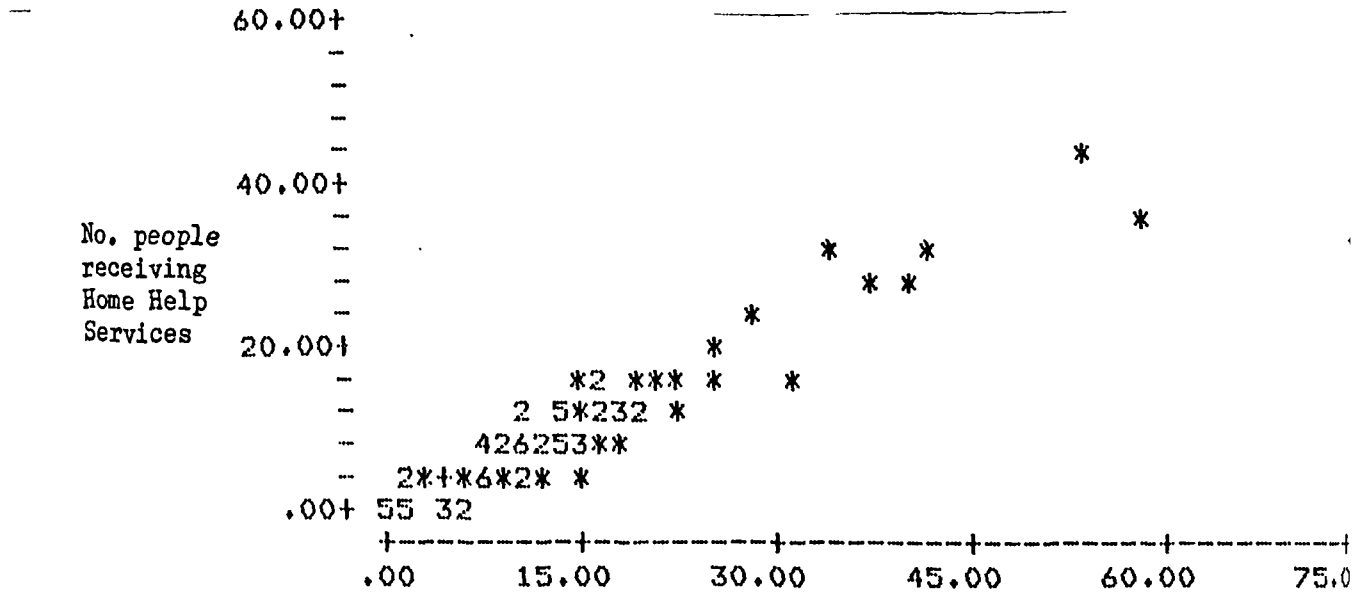
Source : Original Data

Figure 9.3 : Relationship between provision of and need for bath/shower aids of modification for polling districts in Barnet



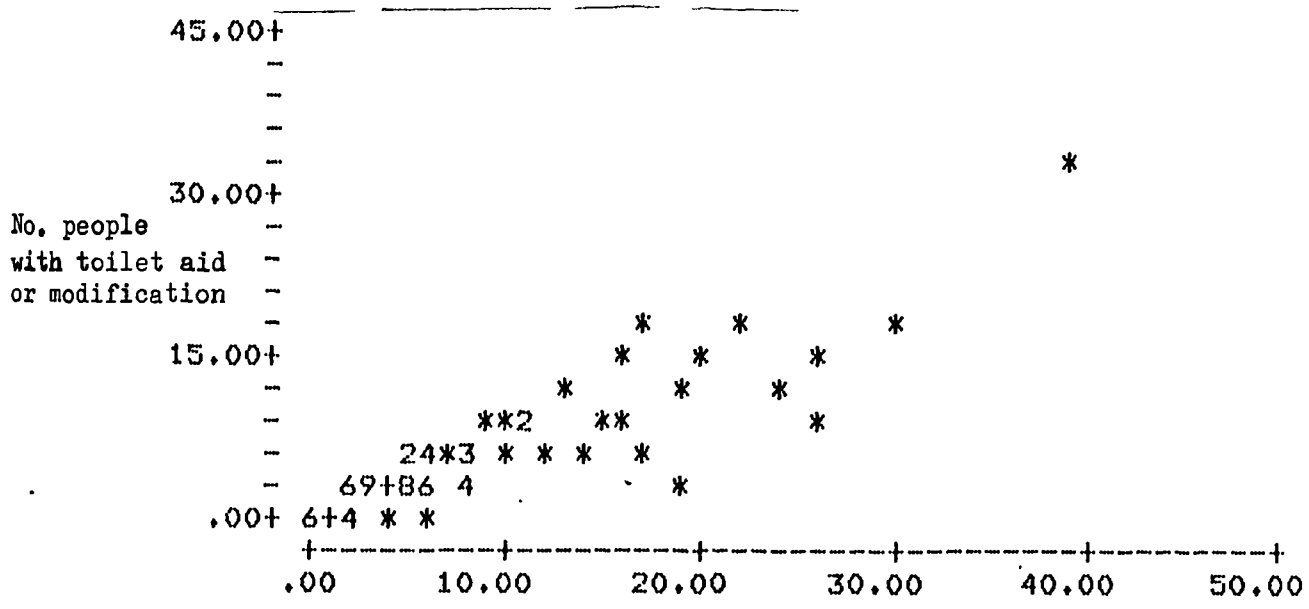
Source : Original Data

Figure 9.4 : Relationship between provision of and need for Home Help Services for polling districts in Barnet



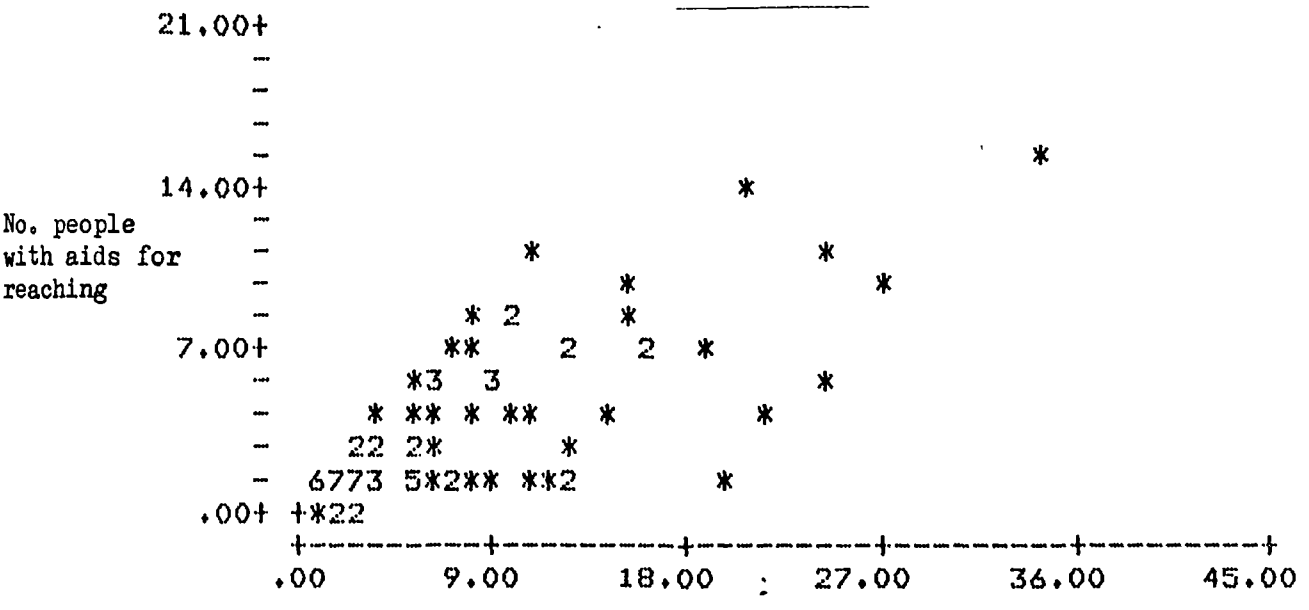
Source : Original Data

Figure 9.5 : Relationship between provision of and need for toilet aids or modification for polling districts in Barnet



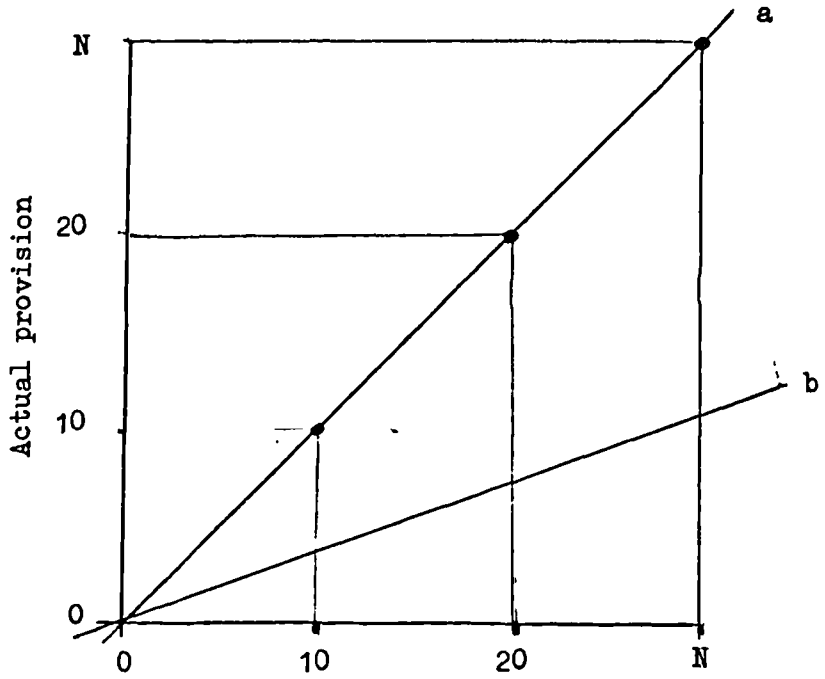
Source : Original Data

Figure 9.6 : Relationship between provision of and need for aids for reaching for polling districts in Barnet



Source : Original Data

Figure 9.7 : Theoretical regression line for a Territorially Just distribution of a service



a = Territorial Social Justice

b = Non- Just distribution

from the tight clustering of points around the trend on Figures 9.1 to 9.5. The close relationship between felt need and provision is also confirmed by the values of R2 in Table 9.6. For the five aspects of service mentioned values of R2 range from 83.5% to 98.9%. As R2 contains within its calculation the sum of the squares of residuals from the comparison of actual and predicted provision levels, it is a good indicator of the "spread" of polling district values around the regression line. These values indicate that, while not fully territorially just distributions, provision of these items does to a great extent reflect local levels of perceived need for them.

In the case of aids for reaching, the slope coefficient is 0.369, very much below the target of 1. This reflects a situation where only one person in three who needs such a service, will ultimately receive it. The R2 value in this case is 60.2%, and an inspection of Figure 9.6 does indicate a wide distribution of points around the main trend. A planner interested in reflecting perceived need for this service may be concerned at the apparent scale of disparity.

9.5 Equity and Rational Prioritisation in Service Provision

In practice we would expect there to be deviation from the theoretical model, even if the Social Services Department were being very careful in seeking out needs. As has been suggested, these could happen for a number of reasons that have been referred to earlier in the chapter, not least the potential difference introduced through different concepts of need and eligibility being in force among administrators than that used in the survey. Our primary concern in looking at the relationship between provision and need is to draw out the implication of any disparity for the pattern of handicap that might relate to it. Any deviation from a service distribution which fully reflects felt need may ultimately lead to more people experiencing handicap for the whole study area. It does not necessarily indicate that the pattern of handicap will be markedly different from the pattern of disability observed.

It was noted that two concepts may be of use in considering deviations in service provision from the principle of Territorial Social Justice. These were equity, and rational prioritisation. A measure of equity in provision may be identified if the level of unfulfilled demand is distributed in proportion to the number of people receiving the service. Where the distribution of unfulfilled demand is not equitable, then there is the potential for a higher proportion of disabled people to experience handicap in areas of high unfulfilment. While this may not be supportable on moral grounds, such a situation may be mitigated if it is a bye-product of a policy which is consciously trying to prioritise for a rational use of scarce resources. In this case unfulfilled need may be less in areas which are

Table 9.6 : Regression analysis of provision vs need for a selection of services

$Cash_n = 4.96 + 1.13\ Cash_p$ (5.09) (3.14)*	$R^2 = 88.6\%$
$Homeh_n = 1.73 + 1.28\ Homeh_p$ (3.79) (7.13)*	$R^2 = 91.7\%$
$Bath_n = 2.95 + 1.28\ Bath_p$ (4.91) (6.26)*	$R^2 = 90.1\%$
$Toil_n = 0.946 + 1.30\ Toil_p$ (2.36) (5.18)*	$R^2 = 83.5\%$
$Tele_n = 0.586 + 1.07\ Tele_p$ (1.35) (5.68)*	$R^2 = 98.9\%$
$Reach_h = 1.56 + 1.65\ Reach_p$ (2.58) (4.81)*	$R^2 = 60.5\%$

Source : Original Data

Where Cash is Advice on welfare benefits etc.
Homeh is Home Help Services
Bath is the need for bath aids
Toil is the need for bath aids
Tele is the need for a telephone or an adaptation
Reach is aids for reaching and picking things up

and $_n$ is the level of need (wants, has)
p is the level of provision to match the need (has)
* Significantly different from 1 at 99% level

priority areas, or which have larger than average numbers of people in priority categories. The distribution of unfulfilled demand may then be seen as related to a rational policy. We now go on to look at the spatial components of any deviations that exist from a territorially just distribution of resources in terms of these two concepts.

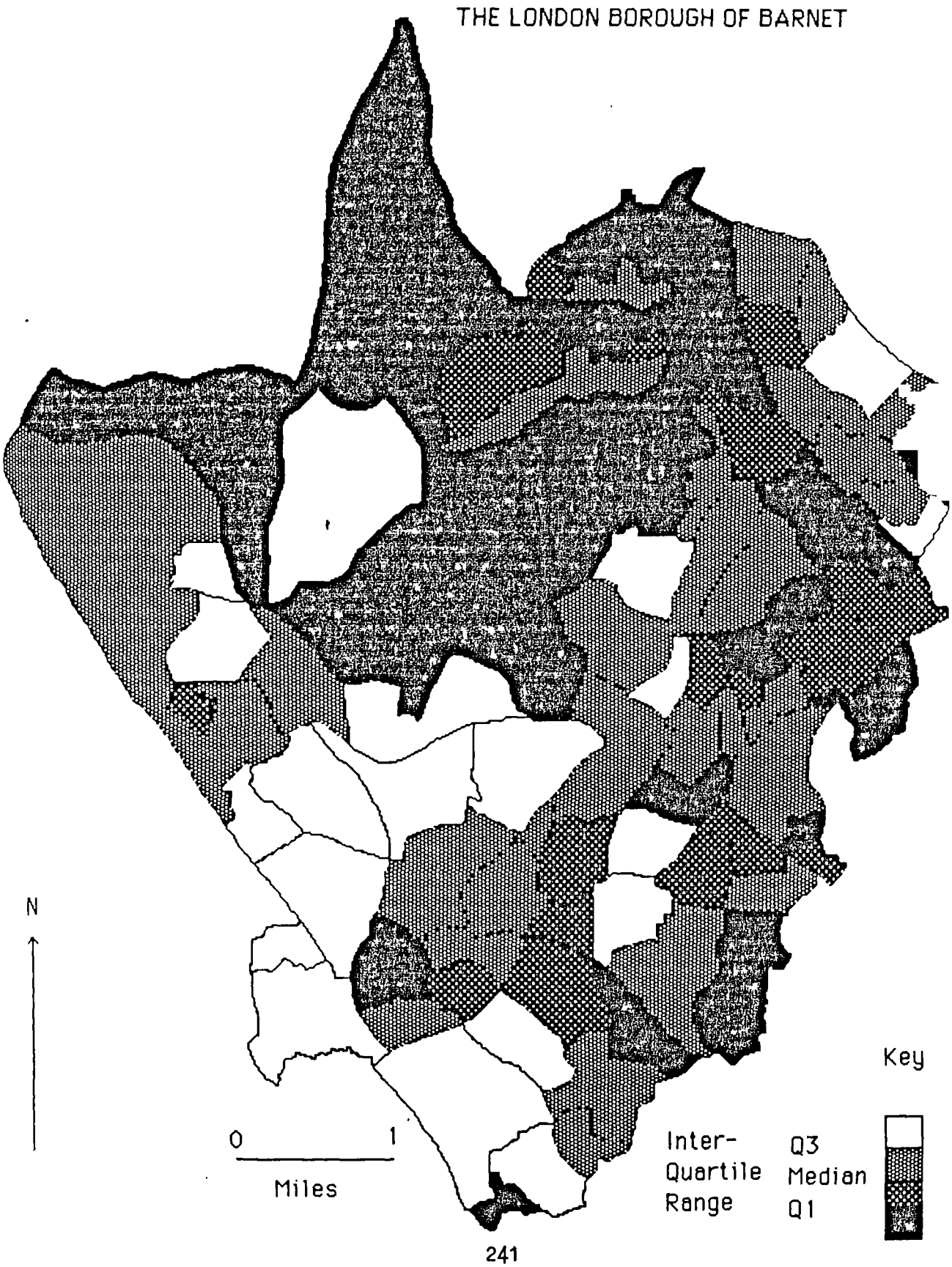
Equitability

While the Borough of Barnet may be congratulated for the overall closeness of the relationship between felt need and provision of those items studied here, it is clear that any unfulfilled demand is not equitably distributed. Due to the individual nature of the data it is possible to build an index for each polling district in Barnet expressing provision as a percentage of felt need. This has been done for each of the six items of service under scrutiny. The data has then been categorised into inter-quartile ranges and mapped on Maps 9.1-9.6. The lower the percentage score the higher the level of unmet need, the higher the index, the more responsive services have been to the felt needs in that area. It is clear from these maps that substantial variation is occuring in the fulfilment of needs, when expressed as felt need. From a visual inspection of these maps, the areas with the best fit between provision and felt need for advice on cash benefits, and aids for toilets and reaching appear to favour the areas with larger council populations to the west of the Borough (Maps 9.1,4,and 6). There is a marked difference for telephones, with the emphasis on the central band of the Borough being better provided for in this respect (Map 9.5). Table 9.7 shows the inter-quartile ranges for the six items of service shown. The range between the upper and lower quartiles varies from a span of 12.2% in the case of provision of telephones, to 53.9% in the case of aids for reaching. While broad disparities in level of met need can be seen in Map 9.5, the provision of telephones, the differences between areas in the level of unfulfilled need is not of great magnitude and may not be a great influence on pattern of handicap experienced. In the other cases however, the potential for disparity is much greater, and there does not appear to be an equitable distribution of unfulfilled need for these services.

Rational Prioritisation

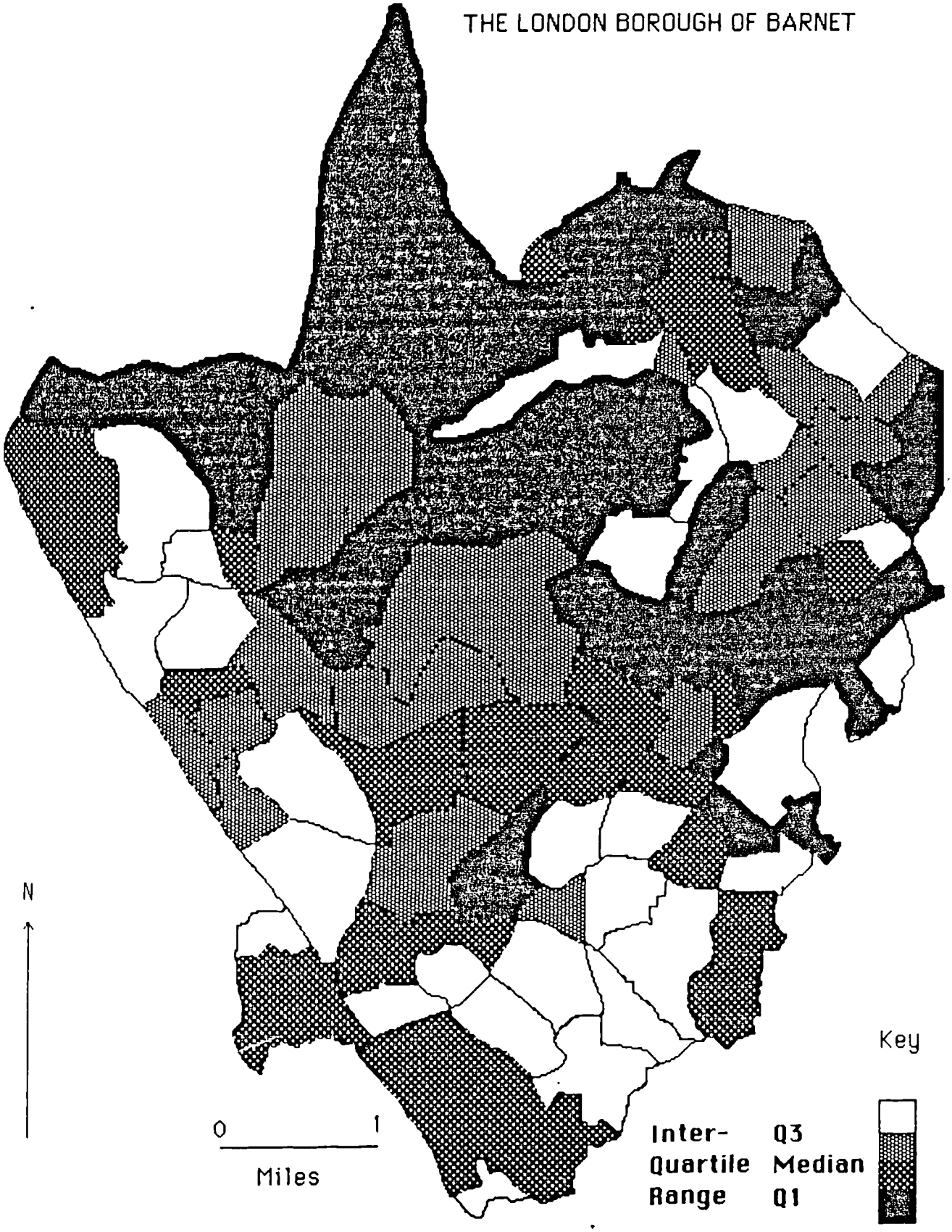
If there is not an equitable distribution of unfulfilled demand from the service elements other than telephones, can a pattern be identified that would represent some kind of rational priority setting on the part of service providers? It is suggested that three sorts of prioritisation may be influential in determining the distribution of unfulfilled demand from the model of provision that is dominant in the area. These are a prioritisation in areas within which there are a large number of disabled people, the group of disabled residents being more likely to receive a service than if they were residing elsewhere with the same disability.

Map 9.1 : Provision of advice on cash benefits , rebates as a % of felt need



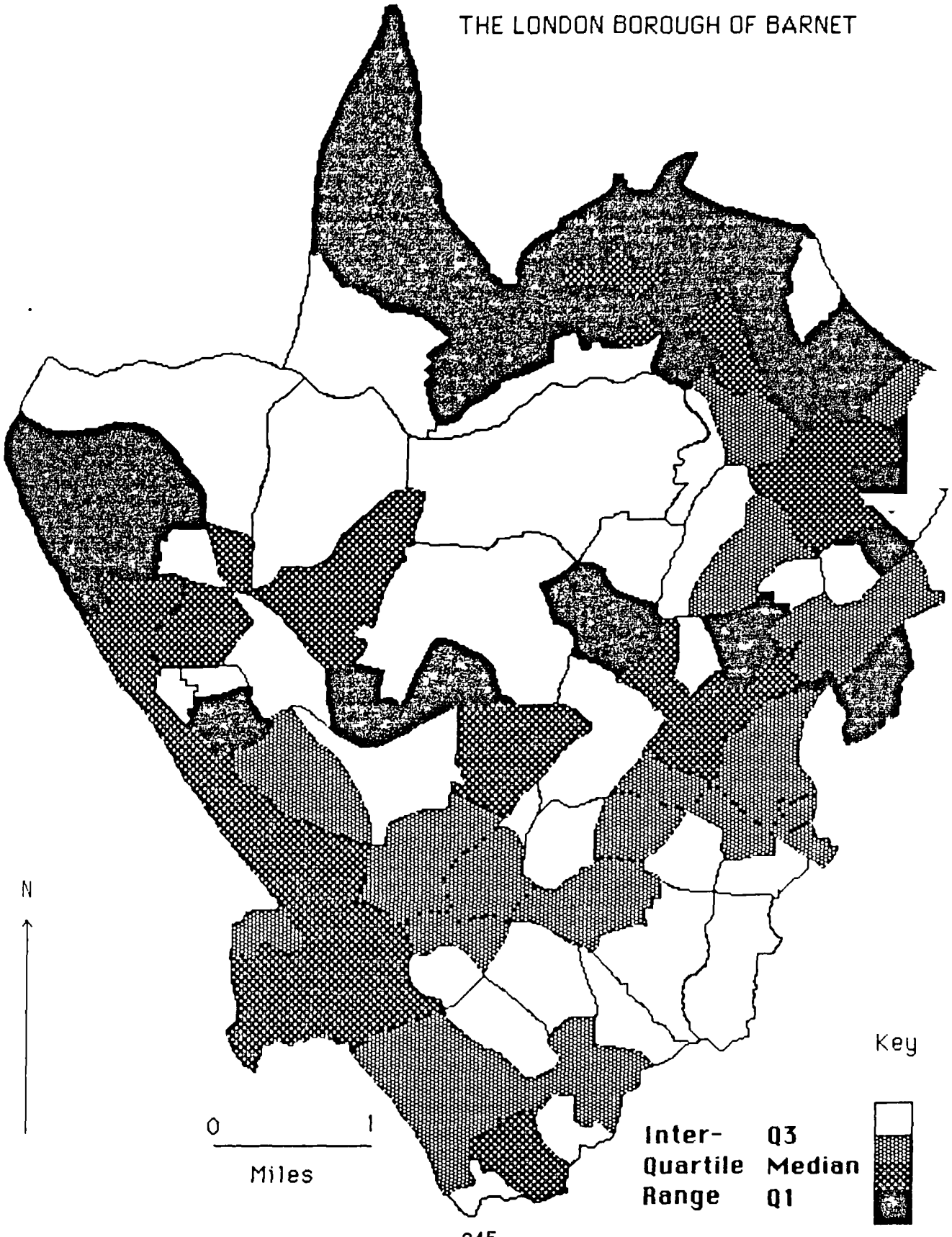
Map 9.2 : Provision of Home Help Services as a % of felt need

Map 9.3: Provision of Bath/Shower aids or modification as a % of felt need



Map 9.4 : Provision of toilet aids or modifications as a % of felt need

Map 9.5 : Provision of telephone or telephone adaptation as a % of felt need



Map 9.6 : Provision of aids for reaching as a % of felt need

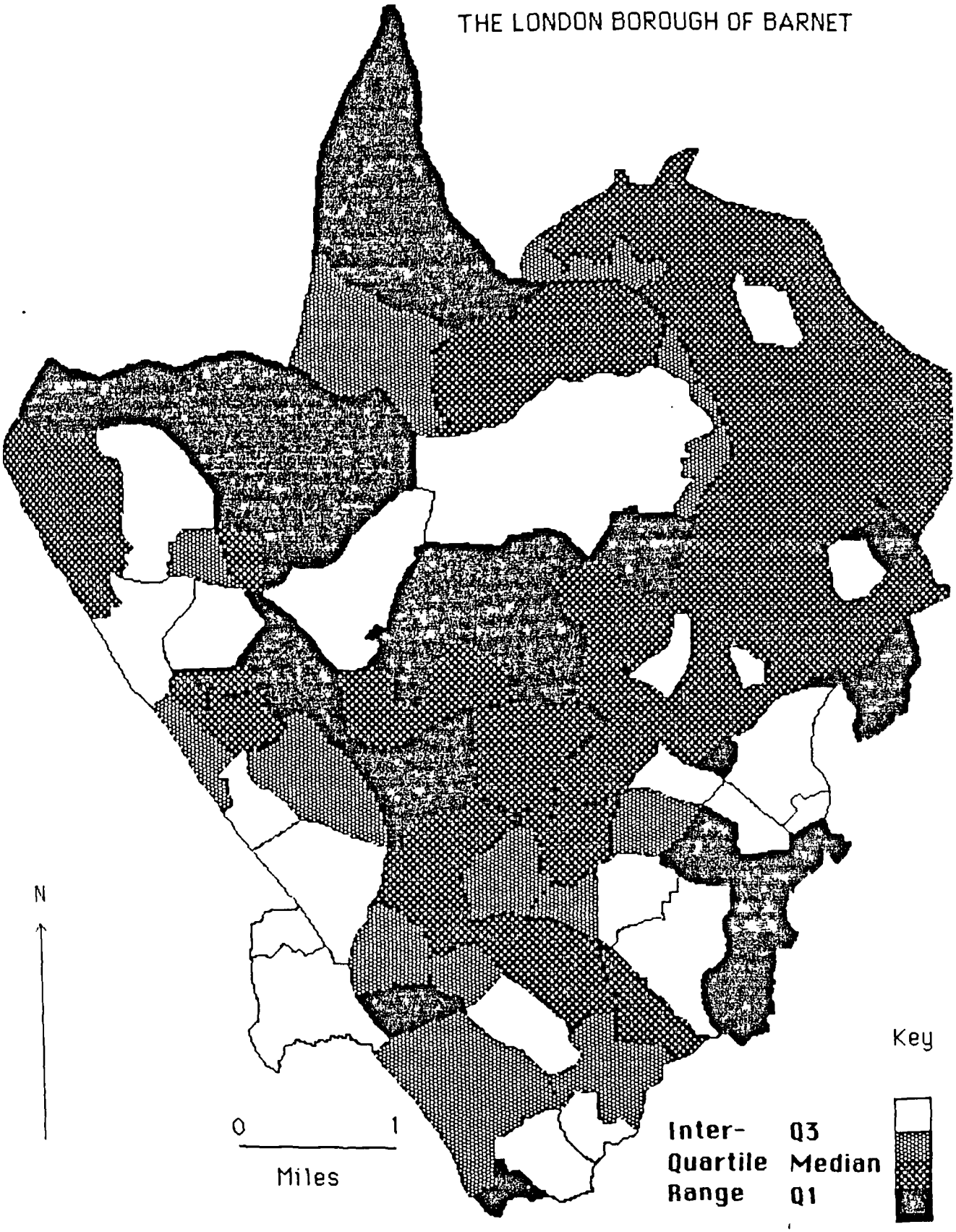


Table 9.7 : Inter-quartile ranges of provision/felt need index for selected elements of service and polling districts in Barnet

	Upper Quart.	Lower Quart.	Range	Median	Mean
Advice on cash ben.	80.8	45.7	35.1	66.7	62.7
Home Help	100.0	66.7	33.3	85.7	81.4
Bath.shower aids etc	77.8	50.0	27.8	64.9	62.8
Toilet aids etc	100.0	50.0	50.0	69.0	68.8
Telephone or adapt.	100.0	87.8	12.2	94.6	90.7
Aids for reaching	82.5	28.6	53.9	50.0	54.6

Index calculated as $I_j = P_j/N_j \times 100$

Where: I is the index for polling district j

P is the number of people receiving the service in j

N is the total number receiving, or wanting to receive the service in polling district j

Source : Original Data

In the first case, the total number of disabled people in any polling district is calculated and correlated against the proportion of people needing selected services who received them. These proportions represent the degree of deviation from a territorially just distribution of services. In the second case the items of service provision are correlated with the number of people reporting difficulty in a relevant area of disability. For example, the provision of bath/shower aids and modifications is correlated with the number of people in each polling district who have experienced difficulty in washing all over or bathing.

In the third case, the provision of these services are correlated with a composite index representing severity of disability. The index is calculated by adding together the number of items of difficulty people experience from a list of 18, and grouping these into three broad groups - slight, moderate, and severe disability. The index is based on Sainsbury's "Index of Incapacity" Sainsbury (1968) which was described in Chapter 1 (Figure 1.7) and derived for those interviewed in the Barnet survey in Chapter 7.

Table 9.8 presents the results of the correlations, and a number of themes emerge. Firstly there is significant correlation between the size of the disabled population itself, and the degree of provision of advice on cash benefits. No other service is significantly related to total numbers of disabled, although home help provision and provision of bath/shower aids do have correlations approaching significant levels.

Only the provision of aids for reaching is related to the number of people having a difficulty of direct relevance, namely reaching and picking things up. This would suggest that there is little rational prioritisation on direct need ground for these particular service. It is interesting that the highest positive correlations for bath aids, toilet aids telephones and home helps are to be found with the number of people having slight or moderate disability. While the coefficients are not significant at the 95% level, they do indicate that provision is more likely to match need where there are greater proportions of less severely disabled people. In the case of toilet aids, reaching aids, and home helps, there is a relatively high negative association between proportions of severe disability and higher levels of satisfied demand.

The figures provide a generally disappointing picture, with little evidence to support the operation of rational prioritisation as an explanation of the deviations from a territorially just distribution of provision. It must be remembered however, that the direct comparison of need and provision yielded a very close correspondence (Table 9.6), and that these correlations are attempting to explain patterns in a relatively small amount of variance. It is in the case of aids for reaching that the difference between need and provision was seen to be most

Table 9.8 : Correlation Coefficients*for proportions of satisfied need for selected services, and priority group indicators

Difficulty	Provision as % of felt need					
	Advice on cash benefits etc	Bath/shower aid or modification	Toilet aid or modification	Telephone or adaptation	Aid for reaching	Home Help
	Correlation Coefficients					
Total disabled	0.230*	0.173	-0.006	0.055	0.074	0.179
Reaching & picking things up	-	-	-	-	0.233*	0.105
Washing all over/ using bath	-	0.040	-	-	-	0.113
Using toilet	-	-	-0.120	-	-	-0.058
Using telephone	-	-	-	-0.061	-	-0.024
Severe disability	0.066	-0.027	-0.155	-0.006	-0.078	-0.105
Moderate disability	0.051	0.119	0.153	0.048	-0.175	-0.216*
Slight disability	0.043	0.074	0.009	0.157	0.178	0.320*

*Correlation Coefficients that are significant at 95%, d.f.= 96

Source : Original Data

marked (having an R^2 of only 60.5), and there is some evidence here that this situation may reflect a process of prioritisation on those people with specific difficulties. Perhaps the most worrying finding from the analysis is the apparent concentration of home help services on those with relatively slight disabilities. If deviations from a territorially just distribution of home help is to be the case, one would expect some form of prioritisation in favour of those with more severe difficulties.

Table 9.9 is a final attempt to provide some assessment of who gains, and who loses from the present pattern of unfulfilled demand. We can see that only five variables are used, and these relate to the key variables identified in the analysis of patterns of disability in Chapter 8. Only two variable generate correlations that are significant at the 95% level. Those polling districts with higher proportions of people in occupational classes IIIM and N are found to have more favourable levels of provision of advice on cash benefits etc. Those areas with higher levels of those in occupational classes I and II tended to have higher levels of provision of telephones. This may not be unexpected, as they are more likely to be able to provide these from their own resources.

If one looks at those correlations that approach significance, one can see that positive correlation exist between good levels of provision of advice in areas with relatively large numbers living in council rented. Negative correlations approaching significance exist between districts with higher levels of people in non-professional classes, and telephone usage, and between those particularily in occupational classes III and provision of aids for reaching. The general impression provided by this analysis is that there is little basis for suggesting there are areas with particular socio-demographic characteristics that are being descriminated against in any deviation from a territorially just distribution.

9.6 Conclusion

When the charcteristics of the observed patterns of disparity were examined, there appeared to be some systematic positive descrimination operating for telephone provision, with areas having higher numbers of severely disabled people being more likely to receive the help they need. For the majority of other services examined, those areas with large proportions of Local Authority housing are less likely to have their need for services satisfied.

The variation in service response will, it has been argued, have an effect on the experience of role loss, and therefore experience handicap. On the limited selection of services used here, there would seem to be a degree of optimism over the extent to which Social Service Departments are living up to their

Table 9.9 : Correlation Coefficients* for proportions of satisfied need for selected services, and socio-economic variables

Provision as % of felt need

	Correlation Coefficients					
	Advice on cash benefits etc	Bath/shower aid or modification	Toilet aid or modification	Telephone or adaptation	Aid for reaching	Home Help
No. people per 1000 aged 75+	-0.036	-0.037	-0.028	0.105	0.085	0.048
Council Rented Households per 1000 General Households	0.187	0.042	-0.007	-0.045	0.022	-0.021
No. people per 1000 in : Classes IV/V (Manual)	-0.014	-0.047	0.013	-0.204	-0.069	0.133
Classes IIIM & N	0.316*	0.070	0.062	-0.117	-0.176	0.116
Classes I/II	-0.160	0.031	0.011	0.244*	0.084	-0.102

* Correlation Coefficients that are significant at 95%, d.f. 96

Source : Original Data

responsibilities in this area, there being a strong direct relationship between patterns of provision of most services, and the need for these services measured in this way. In none of the services we have examined, however, could it be said that a "territorially just" distribution of provision in relation to felt need existed, and hypothesis nine was rejected as a result. The distribution of unfulfilled demand did not appear to be either "equitable", nor follow any systematic policy of rational "prioritisation". No particular spatial groups appeared to be at a special disadvantage however, the unfulfilled demand tending to be more randomly structured.

CHAPTER 10

SUMMARY AND CONCLUSIONS

10.1 Summary of Results

This thesis has been concerned with the spatial patterning of people with disabilities and the spatial patterning of the handicaps they collectively experience. Chapter 1 set out a clear definition of relevant concepts such as impairment, disability and handicap. It showed that these are not objective statements about the situations of individuals, highlighting instead the role that society in general plays in creating disabilities and handicaps for those with difficulties. The Chapter went on to examine a number of traditional and contemporary approaches to the geography of ill-health and their relevance to the social geography of handicap. It was suggested that particular studies and the methodologies they used could be of potential use in explaining patterns of disability and handicap.

In Chapter 2 a variety of sources, such as surveys and registers, were used to show that people with disabilities are to be found in congregations at many spatial scales, leading to identifiable spatial patterns. In our society disability often leads to a need for help and support. Chapter 3 went on, therefore, to examine the various concepts of "need", and to discuss the related concept of "Territorial Social Injustice" in meeting identified needs for help. Levels of provision of key support services for disabled people such as personal aids, special housing and special employment were analysed. Significant differences in levels of provision were identified between regions in the UK, these being unrelated to crude measures of normative need for services in the regions. This finding formed a basis for the assertion that people with disabilities could experience different levels of handicap unrelated to their degree of disability, their handicap being dependent instead on where they lived and the level of service support they enjoyed.

Part II of the thesis (Chapter 4, 5, and 6) systematically looked at the possible reasons why patterns of disability had developed among the general population. Building on suggestions made by previous researchers (Harris,1971; Knight & Warren,1978; Townsend,1979), a number of potential influences were identified- the natural and man-made environment, and personal characteristics such as age, occupational class, and ethnicity. Theoretical perspectives were put forward to explain why occupational class could be influential, this mainly being related to the availability of wealth and resources to the various classes. Links were made to the factors which influence the spatial patterning of people with these characteristics in society, and thereby to the reason for their impact on the geography of disability. In Chapter 6 the consequences of onset of disability for employment and life-style were

addressed, along with the constraints these have put on location. The consequences for the spatial patterning of disability were discussed.

All of these factors were thought to have a potential for affecting patterns of disability, although their relative importance was potentially different depending on scale of analysis. Chapter 6 pulled these mechanisms together in a conceptual model that set out to explain observed patterns of disability at intra-local authority scale. The model contained three sets of factors. "Generative Factors" were those which had a direct influence at the level of disabling disease and, therefore, were responsible for the basic patterns of prevalence of disability. "Intervention Factors" were split into health related services, which helped reduced local rates of disease and impairment, and social services, which helped reduce the effect of impairment and level of disability in people's lives. The third set were termed "Redistribution Factors" and related to the choices people make, or constraints they face when disabled, and which determined where they are most likely to live. Redistribution Factors were generally seen as reinforcing the patterns produced by Generative Factors, making it more likely that disabled people would locate in areas already characterised by groups at high risk of contracting disability in the first place.

From these factors, nine hypotheses were generated, five relating to Generative Factors, and dealing with the prospective role of environment, age structure, occupational class, occupational structure and ethnicity on prevalence of disability. Three hypotheses dealt with redistributive factors, and involved the influence of special housing for people with difficulties, council housing, and areas with low levels of basic ameneities on levels of disability. Finally the ninth hypothesis set out to test whether provision of help from personal social services reflected the need felt by disabled people, thereby determining the degree of Territorial Social Justice that existed in the study area.

In Part III of the thesis the results of the Outset Survey in Barnet were presented. The important elements of the survey were the fact that it had a very high coverage of the disabled population, approximating to a 100% household survey. This allowed a detailed examination of where people were geographically, what difficulties they faced in everyday life, and what their perceived needs were for help and services. This provided a basis for testing the eight hypotheses derived previously from the literature. The survey also allowed the concept of Territorial Social Justice in service provision to be tested on the basis of individual responses rather than on normative assessments of need.

In Chapter 8 the historical, social and demographic context for the analysis was presented. Through the use of a series of predictive models based on survey data,

the relevance of generative factors to the situation found in Barnet was investigated. Age structure was identified as the single most important factor, explaining 41.7% of the observed spatial variation in prevalence rates. Occupational class was subsequently found to be significant. A large degree of spatial overlap between non-professional class groups in Barnet meant that the clearest association was found to be a negative relationship between numbers of professional and managerial workers in an area and the associated prevalence of disability. A joint age/occupational class model explained 57.3% of the variance in prevalence of disability. The influence of the working environment (measured through occupational structure), and ethnicity were not found to be significant influences on prevalence rates.

When redistibutive factors were introduced, public sector housing tenure was found to be a more powerful predictor than occupational class. This was due to the fact that the housing tenure variable was presented as a probability derived directly from the survey data. The strong positive relationship between public housing and manual occupational classes in Barnet meant that the effect of occupational class was obscured. An age/tenure model explained some 58.6% of the variance in prevalence across polling districts. Housing of low amenity , as measured by shared use of three basic amenities , was found to be significantly related to prevalence, but made no significant contribution to the amount of variance explained. When a variable indicating the influence of sheltered housing for the elderly was introduced, these being counted as community facilities in the survey, the explained variance rose to 65.3%.

From here attention was focussed on the polling districts that were not being adequately catered for by the regression model, i.e. those with large regression residuals. The disease structures of these districts were compared with that for Barnet in general using analysis of variance, to see if any support could be given to natural environmental hazards being the cause of higher rates of disability prevalence. The disease structures were not different and the influence of natural environmental factors was rejected. In the final analysis five out of eight of the hypotheses forming the conceptual model of disability were supported, and a statistical model produced that explained two-thirds of the pattern in Barnet. This provides a good basis for a subsequent discussion of the importance of this study to medical-social geography.

In Chapter 9, the service needs of those interviewed were presented. This showed that most commonly people were looking for help with the ordinary tasks in life rather than help requiring special skilled input. Requests for house and garden maintenance, social outings and occasional transport were common. More skilled help was required in foot care, in advice services, and in the provision of special aids such as bath aids, reaching

aids and ramps and rails. When the proportion of people in polling districts wanting a core number of services was compared to that of those currently received these services using maps and regression techniques, strong positive associations were found. The regression equations did not however, approximate to a "one-to-one" relationship that would be indicative of a Territorially Just situation. In addition the variance explained ranged from 60.5% in the case of aids for reaching, to 98.9% for provision of telephones.

The spatial differences that are represented here were examined to see if the deviations had any logical explanation. Two potential reasons were put forward. In the first, deviations were hypothesised to be distributed in proportion to the number receiving services in an area; a spatially equitable if not fully just situation. In the second the pattern was hypothesised to reflect a policy of rational prioritisation, those districts in greatest "need" receiving more services than others.

The results showed that there was not an equitable distribution, larger council areas seeming to have a higher proportion of their needs being fulfilled than elsewhere. Patterns were correlated with total numbers of disabled, patterns of severity of disability, and prevalence of difficulties directly related to the core services under investigation. Little evidence was found for the operation of rational prioritisation, and there was some evidence to suggest that districts with more severely disabled residents were in fact less likely to have their needs fully satisfied. Finally, residuals were examined to see if any particular groups were "losing out" in terms of service allocation. Professional groups were found more likely to obtain telephones, while those in occupational class III were generally more able to get the services they felt they required. In general however, the relationship between perceived need and provision in Barnet was encouraging close.

10.2 Methodological Implications

The methodological issues arising out of this study relate to the adoption of an "ecological analysis" approach, and the use made of some exploratory data analysis techniques, mainly relating to the analysis of residuals from regression analysis. On the first issue, quantitative geography has frequently come under attack for the naivity of the models constructed, and for an emphasis on the use of statistics for their own sake. The problem has often been that researchers have lacked detailed theories and mechanisms that can explain the causal relationships between variables related by statistical analysis.

In this study an attempt has been made to test hypotheses that are based on sound theoretical and practical insights on how different levels of disability may be generated. Ecological analysis as proposed by Johnston (1975) provided a method by which these insights could be

tested while avoiding , at least in part, the problems of the "ecological fallacy". The methods involved relied on the availability of detailed survey data for which the Outset survey data was well suited. The combination of a strong body of theory, ecological analysis, and detailed survey data in this study have shown that quantitative methods continue to have a powerful role to play in understanding urban problems.

In this study the data only allowed part of the analysis to be carried out at the level of probability. The Outset survey did not, for example, provide information on the occupation, ethnicity or full housing status of the disabled people interviewed. The resulting model was, therefore, a hybrid, being based on probability of disability for age structure and crude housing tenure, while other variables were introduced through regression analysis. The use of probabilities derived directly from survey data do allow conclusions to be more firmly stated than those involving the correlation of variables. Problems do arise from the use of a hybrid model, and in this analysis the spatial overlap that occurs in Barnet between patterns of housing tenure and occupational class obscured any seperate influences on prevalence of disability they may have had. If ecological analysis is to be most effectively used it requires additional thought to be given to survey design prior to information collection in order that information on key explanatory variables can be collected from respondents direct.

Earlier uses of ecological analysis, mainly in the field of political geography, involved the concept of the neighbourhood effect, where local environmental influences have a seperate effect on behaviour over and above that of individual predisposition. In the health context there is no simple neighbourhood effect. As we have seen, the mechanisms for generating disability in an area are too complex for an all encompassing explanatory theory. In this study the use of residuals and techniques associated with their analysis have enabled a subtlety of approach to the study of that neighbourhood effect. These techniques, when used with ecological approaches, have the potential for isolating the known causes of patterns in health status, and enabling attention to be focussed on the parts of the pattern that require more investigation and theory building.

10.3 Implications for Service Provision

The study has a number of implications for those providing services. One of the main findings is that prevalence of disability within local authority areas can be clustered spatially, and the characteristics of those areas "at risk" of higher levels of disability are to a large extent predictable. Current Social Services information systems relate in the main to those people on their case registers. These systems are notoriously difficult to keep up to date, and by definition ignore those who do not currently receive any service. One may feel that all in need are likely to be known to the

appropriate services. This is not generally true however, the Outset survey in Barnet having identified a significant proportion of disabled people who were not previously registered with the local authority. When planning has been carried out in the past, services have often resorted to the prediction of unidentified demand, basing predictions on probabilities derived from national survey results, or crude demographic models applied to the census.

The findings of this study show that, while age is a major factor in the determination of disability prevalence, there are very significant deviations for some areas from levels predicted on the basis of local age structure patterns. For the reasons already presented, occupation class structure and the distribution of council housing across areas needs to be taken into account. It is also important for services to note that those with severe disability are not distributed in proportion to total size of disabled population. In this study, a tendency has been observed for areas with the highest total numbers of disabled people to also have the largest proportions of these populations in severe disability categories, Burnt Oak and Colindale being cases in point. Unsophisticated projections would not necessarily reveal this.

Social Service Departments, and Health Authorities still commonly face a whole range of locational decisons in provision of services. These include the spatial allocation of Home Helps across the various districts and teams of a Borough, and the day to day balancing of the time Home Helps, and many Community Health Staff, spend giving care, with the time they spend travelling between clients. The identification and move towards small but meaningful team "patches" continues to be a focus for much energy. Debates have also taken place over the best mechanism for providing food for elderly and disabled clients. Meals-on-Wheels in the home have provided a traditional approach, but localised luncheon clubs providing additional supports have grown in popularity.

The irregular clustering of demand for services, and in the severity of the disability faced, would mean that local levels of provision could not be planned on the basis of, for example, a standard rate of provision per 1000 resident population. An appreciation of which areas are most likely to contain the largest levels of demand would enable the adoption of local strategies to meet the additional needs. One approach would be to provide more staff in these areas, but in the current financial situation this is not always possible. Evidence from this survey does however, provide a clue to the nature of the task to be done, and to possible strategies for meeting the need in the current economic climate.

We have seen in Chapter 7 that the majority of disabled people are slightly or moderately disabled, and that many of the difficulties they face are simple ones, in the sense that they do not necessarily required skilled

intervention. Chapter 9 has shown the help that many people wanted was in terms of work around the home, collection of pensions and the like. One can envisage a re-specification of the service task in the light of this, service people working locally to promote good neighbour, and voluntary schemes, and other informal networks to help with less specialised tasks, while concentrating on the more difficult and skilled work themselves. Where the demands of such areas was already being addressed, it is likely that many professional would find themselves crossing and re-crossing each others paths. The need would then arise for greater communication and a more multi-disciplinary approach to the problems they jointly faced. The very fact that major spatial clusters do exist, with the greater depth of difficulty involved, could provide a natural context for the development of a more community work orientated approach on the part of services, and one involving greater integration of service responses. Given the complexity of services today, any such integration would be of great benefit to disabled clients of these services.

The ultimate need for residential care by those in areas of high risk is also a significant factor. Where support at home does not prove to be effective, the demand for high levels of personal support provided in residental care or hospital is increased. Residential places are unlikely to be available in the numbers required in high risk localities, leading to the inevitable relocation of disabled people out of their local environment. With this comes the disruption of local social contacts, and severed links with family and friends, all of whom provide emotional and practical support to disabled people. Investment in a community task force approach for these problem areas would have the additional advantage of maintaining and enhancing existing support networks for those concerned.

The study has shown the use to which detailed individual level data can be put.Practically speaking however, research resources are as scarce as resources for service provision. An awareness of the factors that create areas at risk of high rates of disability can be used to target these scarce research resources. Districts or zones might be chosen on the basis of their scores on key census variables, becoming the target for detailed sample surveying looking at need for service. Such an awareness could also be used to identify many years in advance the kinds of locality which may face problems later. A start might then be made on building the community support structures needed to sustain a growing disabled population.

Monitoring of the quality of service provision is an aspect of policy that is increasingly to be found on the agenda of Social Services Departments. Professionals are themselves realising that statements on how many social workers or home helps are working in an area, or how many residential places are being offered, are not sufficient

in themselves as indicators of service quality. This study has shown that surveys can provide a detailed and important means of assessing the spatial impact of service allocation policies. For some aspects of provision, where one lives can determine the help one receives, and this needs to be taken into account in any monitoring policy a department operates.

10.4 Implications for Medical-Social Geography

The term "Medical-Social Geography" (Phillips,1981) has been used here in discussing the spatial study of human health problems in preference to "Medical Geography" because of the the wide range of traditions that have been adopted over the years, and the tendency for these approaches to border increasingly in recent times on other disciplines. The broadening of medical geography to encompass health and service provision, and its involvement with many other disciplines, has to an extent been due to a change in the way researchers see the problem they are tackling.

In the medical ecology and disease ecology approaches the influence of the natural environment were seen as the problem, efforts being directed towards the identification of causitive agents. The associative ecology and social area studies saw the problem not in terms of natural environment, but in terms of the role of poverty, deprivation, class and life-style in determining levels of ill-health, among other negative social consequences. In the more recent move to behavioural approaches we have seen the notion of the problem shift to the constraints operating on individuals that influence their consumption of health care, and equity of access between social classes.

In reviewing the various approaches that make up traditional and contemporary approaches to medical geography, the argument is not whether any one tradition, or methodological stand point is more legitimate than another. The more useful argument is how relevant is each to the problems we see around us today in a world that is increasingly seeking solutions to problems. As Phillips has pointed out, the maintainance of strict boundries between disciplines in the area of health research:

> "have been a major hinderance to health services research", and that "...an external or problem-solving orientation is a necessary impetus for change or innovation"
>
> (Phillips,1981;Chapter 6).

It would be wrong to say that traditional approaches are less relevant than contemporary approaches because the contemporary focus is in some way "more" problem centred. Disease and disorder mapping, and the range of ecological associative studies can be problem related, and one would have to look far to find a more practical

and problem related piece of work than Snow's original study on Cholera in Victorian London, or other more recent work based in the third world. It would be true to say, however, that the effectiveness of traditional studies in helping to identify and solve problems might well be improved by an additional perspective on the role of poverty and culture on disease ecology.

In our western context the major health problems facing us are not those of communicable diseases which have lent themselves more easily to traditional geographical approaches (although the recent spread of AIDS raises the spectre once again). The major problems of the developed world are those of heart disease, over consumption, bad diet and others related to long-term impairment and disability, including mental illness. In this context Phillips suggests that :

> "The most fruitful avenues for future medical geographical research would appear to be those which include aspects from both of the previously identified traditional and contemporary approaches to the subject as well as subsuming relevant factors from the social sciences approaches"
>
> Phillips (1981,pp 31)

Giggs (1979,pp 85) has provided a useful summary of the various areas of geographical study in the field of human health problems and this was discussed in Chapter 1. It will be remembered that he suggests the relevant areas for research fall into the following three categories :

1. The spatial patterning of ill health and mortality.

2. The spatial patterning of the physical and human environmental characteristics which adversely affect man's state of health

3. The spatial patterning and use of the main elements of the health care delivery systems developed to combat diseases and the environmental hazards which affect man's health

A brief review of the various traditions of study relating to these areas of concern led this author to conclude that studies and methods from all the traditions were potentially relevant to the social geography of handicap. This was subsequently comfirmed when a review of studies from these traditions carried out in Part II of the study revealed that social and physical environments may be related to chronically disabling as well as infective diseases.

At face value the health trends in the west would seem to suggest that there would be little relevance in the use of the less sophisticated disease ecology and ecological associative approaches. The current study gives support to Phillips's statement on the importance of combining approaches. The study did adopt an analytical framework akin to some of the more traditional ecological associative and social area study approaches. The study was however, able to avoid some of the draw-backs associated with these more traditional forms of research. Firstly, the study incorporated an individual perspective on the difficulties faced by people with a disability through the use of individual data, helping to move away from the some of the problems of ecological validity that constrain associative forms of study. Secondly, the study utilised theoretical perspectives from sociology and political economy to derive a reasonable set of relationships linking causes and effects, thereby making sure that the hypotheses to be tested were at least plausible.

The influence of the natural or man-made environment was also seen as being important in the model of disability prevalence put forward in the study. Basic mapping techniques were used to look for these effects. The approach taken in the study again differed from previous studies looking at the role of environment. In this study the techniques were used in an attempt to explain the high residual prevalences of disability that other factors could not, rather than to provide explanations for the overall observed patterns. While significant environmental influences were not identified in the study, the experience suggests that more traditional approaches to disease mapping and environmental association derived from medical geography may be useful in other locations, if used to explain very local deviations from patterns of ill-health that are largely explained in other ways.

It is suggested that the explanations put forward for patterns of disability in Barnet would have been much more difficult to derive if only one type of approach had been adopted in place of an integrated approach.The social geography of handicap provides a very good example of the power of an approach that brings together relevant aspects of both contemporary and traditional forms of geographical research with insights derived from other disciplines.

In attempting to obtain a comprehensive understanding of what patterns of disability exist, and why they exist, this study has addressed categories one and two of Giggs's model successfully. On the third category a number of issues are raised by this study. It has been recognised that long-term disabling disease is a major problem in the west today. For many of the people interviewed in this study, the medical model of intervention is not

appropriate, because their condition is stable or not fully curable, leaving the main task to be that of overcoming the difficulties that result from disabling disease. Given the arguments put forward here in Chapter 1 and 2 on the relationship between disease, disability and handicap, it would seem the provision of services to relieve the consequence of disease is a legitimate concern of medical-social geography that concerns itself with disease and the problems it causes.

This is not to say that the study of "the spatial patterning and use of the main elements of the health care delivery systems developed to combat diseases" (Giggs's third category) is not important and influential in relation to disability. Spatial inequalities in the medical services that fight potentially disabling disease, in antenatal care, in screening services, in health education services, and in other forms preventative medicine will all contribute to differences in levels of disability prevalence. The influence of these factors (acknowledged under Intervention Factors earlier in this study) are long-term, difficult to identify and outside the scope of this study.

The inclusion of Giggs's third category is necessary but not totally sufficient for a full understanding of the social geography of handicap. It would seem that for medical-social geography to fully address the current health problems faced by western society, Giggs's three point model needs to be extended to a include a fourth area of study for medical-social geographers :-

> "The spatial patterning and use of service systems developed to overcome the long-term disabilities and handicaps imposed on man by disease"

This concern is especially important when viewed in terms of criteria of relevance and problem orientation. Those agencies providing support to disabled people are become increasingly self critical, and see the evaluation of the help they provide as problematic. Many service providers are beginning to question the wisdom of evaluating quality in terms of levels of input, be it numbers of staff or hostel places or items of equipment. The complexity of providing care in the community is beginning to make staff themselves look at the outcomes they are achieving for clients, the quality of life they are providing for people, instead of using administrative definitions of level of provision .

This study has made a small attempt to look at the client's side of things by looking at patterns of provision in relation to what disabled people feel they need. Hopefully this provides an indication of what can be done by adopting criteria of need other than aggregate normative criteria, and through the use of individual data. If medical-social geography is to respond to the new "problems" of how clients are experiencing services and how territorial just the distribution of "good experiences" are, it would seem that there is a need for

an even greater involvement by those with a behavioural perspective.

10.5 Future Research in the Social Geography of Handicap

Work on this study has identified a number of areas where additional research would be beneficial. Taking the task of coming to a better understanding of how patterns of disability are created, there is a need for the wider testing of the model derived here. This could be used to predict the levels of disability in other areas and be compared if data exists on actual numbers. This would ideally be carried out at a number of scales including intra-local authority, intra-urban, and intra-regional scales. It is possible that as scale increases some of the key variables reduce in importance while others, such as the range of occupations held, may increase in importance. It would also be important to see the effectiveness of the model in areas which were less socially polarised, or which were whole socio-economic systems rather than only parts of Greater London.

Another approach needed would be the completion of additional sample survey work, data from which should be of a type directly related to the production of ecological models. Information from individuals on occupation and ethnicity would, for example, allow ecological models to be generated completely from characteristic/prevalence probabilities, thereby removing the problem of the ecological fallacy occuring in mixed models. Such studies would be in a position to include information on levels of informal support and personal resources that may influence the impact of disabling disease on the everyday life of people in different areas, and subsequent need for services.

While the study dealt with the provision of a wider set of services than that envisaged in Giggs's third concern for medical geographers, further work is required on the role of health provision in the creation of patterns of disability. This would provide a more balanced assessment of the importance of "intervention factors" put forward in the studies conceptual model. This would be dependent on whether the problem of the long time periods over which health care influences patterns of disability can be overcome.

The study has made a small start in identifying spatial injustice in the way that disabled people experience services. There is a need for work to be done from the organisational perspective to determine why any inequalities should exist. Are these inequalities conscious acts of policy as in the case of service rationing procedures, or are they merely random problems in planning or delivering services?

Finally, if medical-social geographers become more concerned with the behavioural perspective on service delivery and with the clients experience of help and support, a whole series of new opportunities for

integrated approaches may open up. This study has drawn attention to the potential effectiveness of a range of approaches in understanding patterns. Current community care policies at national and local level are beginning to pose new problems at the level of the individual, these problems having important spatial dimensions. In the case of people with mental handicaps, the move to provide homes in ordinary houses in the community has now broadened under the influence of the "Normalisation Principle" (Wolfensberger,1972). The task is now being seen as creating real lives in society rather than merely a smaller institution in which to live. The problem to be overcome is seen as one of society devaluing the lives of people with handicaps. Part of the solution is the reversal of the process of devaluation, this being partially achieved through the presentation of the handicapped person in positive situations. This can involve understanding what the dominant and most valued ways of using of time are for the population generally, what places in the local community people use and value, and how local friendship and acquaintancy networks form. From this local information people with handicaps can be introduced into the community in ways and in places that enhance their image in the eyes of that community, and facilitate greater integration. It is likely that Time Geography and a range of behaviourally focussed approaches have the potential for being combined with other traditions in geography and social science to help handicapped people and services in this important work.

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APPENDICES

Appendix 1 : Aids, Adaptations and Communication equipment by local authorities 1977/78

	Net Expenditure per 1000 Resident Population on :-		
	Aids	Adaptations	Communications
Southern			
Kent	40	47	59
Wiltshire	60	69	38
Hampshire	19	27	32
Dorset	82	24	65
Surrey	41	38	33
Isle of Wight	43	234	31
West Sussex	47	103	74
East Sussex	42	20	30
East Midlands			
Nottinghamshire	59	81	81
Leicestershire	48	76	59
Northamptonshire	29	54	62
Derbyshire	63	78	45
Lincolnshire	33	15	15
South West			
Gloucestershire	45	22	31
Devon	6	43	27
Cornwall	37	10	24
Avon	31	31	30
Somerset	57	29	28
North West			
Manchester	72	348	343
Liverpool	76	367	147
Lancashire	28	49	97
Stockport	34	70	80
Oldham	106	74	72
Tameside	26	131	94
Trafford	77	56	88
Wigan	131	128	75
Knowsley	34	75	144
Rochdale	28	66	64
Salford	17	27	73
Wirral	*	*	*
Sefton	69	176	72
St.Helens	53	62	55
Bolton	44	89	49
Cheshire	36	75	81
Bury	*	*	*

	Net Expenditure per 1000 Resident Population on :-		
	Aids	Adaptations	Communications
West Midlands			
Coventry	45	20	89
Sandwell	*	*	*
Birmingham	23	113	65
Warwickshire	40	15	42
Staffordshire	47	51	46
Wolverhampton	56	125	0
Salop	10	8	38
Hereford & Worcs.	41	47	74
Walsall	37	26	29
Dudley	10	37	42
Solihull	50	7	34
Wales			
West Glamorgan	63	149	191
Mid Glamorgan	68	105	91
Gwynedd	32	52	48
Clwyd	56	101	105
South Glamorgan	47	35	90
Dyfed	61	59	64
Gwent	21	41	36
Powys	36	110	21
Northern			
Newcastle	131	120	110
South Tyneside	52	120	62
Durham	53	67	37
Gateshead	29	89	38
North Tyneside	20	88	33
Sunderland	48	144	28
Cleveland	51	62	37
Northumberland	49	123	31
Cumbria	32	46	26
Yorkshire & Humberside			
Doncaster	31	127	24
Humberside	21	36	33
Sheffield	30	54	38
Rotherham	164	66	34
Wakefield	55	100	41
Kirklees	228	295	187
North Yorks	56	37	55
Leeds	33	38	18
Bradford	34	37	16
Calderdale	7	49	20
Barnsley	16	152	0

	Net Expenditure per 1000 Resident Population on :-		
	Aids	Adaptations	Communications
London North			
Bedfordshire	88	52	137
Berkshire	60	17	13
Oxfordshire	49	60	54
Hertfordshire	74	110	69
Essex	32	47	44
Buckinghamshire	5	22	31
Norfolk	47	103	74
Cambridgeshire	34	38	21
Suffolk	47	19	21
Outer London			
Hillingdon	228	295	187
Haringey	40	22	234
Waltham Forest	57	22	92
Brent	106	82	213
Richmond	21	126	155
Ealing	32	59	87
Barnet	142	115	138
Bexley	28	34	82
Redbridge	53	60	80
Hounslow	53	18	68
Harrow	54	22	92
Sutton	16	124	65
Havering	0	14	68
Barking	69	70	93
Enfield	46	59	72
Bromley	32	126	48
Newham	0	0	0
Croydon	30	9	33
Kingston	51	48	42
Merton	349	52	116
Inner London			
Islington	*	*	*
Wandsworth	153	451	505
Camden	98	49	301
Lewisham	98	170	304
Greenwich	37	288	365
Westminster	149	32	196
City of London	105	49	186
Hackney	17	76	137
Lambeth	158	92	124
Kensington	57	41	126
Hammersmith	101	58	114
Southwark	51	34	60
Tower Hamlets	160	160	265

* No figures available
Source : C.I.P.F.A.(1978) and 1971 Census

Appendix 2 : The Agerholm Handicap Profile

SECTION I PERSONAL

A. Code No. 206066 — Male ☐ Female ✓

Date of Birth: D 30 M 7 Y 09

Date of Completion: D 14 M 3 Y 80

Type of housing: Local Authority ☐ Other ✓

B. HANDICAP(S)

Please state kind of handicap (e.g. deafness, difficulty in walking, weak or stiff hands, mental retardation)

1. Tiredness.
2. Difficulty walking. Only goes out with husband
3. Breathlessness.
   Poor eyesight.

and causes (if relevant) e.g. a diagnosis, like arthritis, multiple sclerosis, epilepsy, amputation etc.; or "ageing"

1. Pernicious anaemia
2. Removal of top ~~half~~ upper lobe of left lung.
3. Fractured femur
4. Rheumatism in knees

C. MOBILITY CHARACTERISTICS

Tick most appropriate group

1	Normally ambulant	
2	Ambulant but restricted	
3	Ambulant with aid (stick, frame etc.)	
4	Ambulant only with fitted appliance	
5	Ambulant only with artificial limb	
6	Walks but falls	
7	Walks but needs guiding or personal support	✓
8	Walks but cannot stand/sit unaided	
9	Wheelchair user	
10	Wheelchair bound	
11	Bedbound	
12	Other	

* COMMENTS OR ADDITIONAL INFORMATION ON ANY PART OF QUESTIONNAIRE

All enquiries relating to this form to:

OUTSET 'ACTION ON HANDICAP'
1 FRIERN PARK,
LONDON N.12. 959 0915

SECTION II DIFFICULTIES EXPERIENCED

DO YOU HAVE DIFFICULTY WITH (tick appropriate items)

	A. GETTING OUT AND ABOUT ? ✓		F. SELF CARE ? ✓
1	Getting in and out of house	✓	1 Getting up (dressing and toilet)
2	As pedestrian	✓	2 Going to bed (undressing and toilet)
3	In shops etc	✓	3 Using toilet
4	On public transport		4 Washing all over using bath ✓
5	As self-driver		5 Foot care ✓
6	As car passenger	✓	6 Feeding and drinking
7	As cyclist		7 Preparing own food ✓
8	As wheelchair user		8 Altering position in chair, bed etc.
9	Because of severe fatigue	✓	9 Weak (leaking etc.) bladder
10	With parking		10 Weak (leaking, etc.) bowel
11	With toilets		11 Other (state)*
12	Finding way around		
13	Using guide dog		
14	Emotional problems		
15	Behavioural problems		
16	Special risks	✓	
17	Other (state)*		

	G. SPECIAL SELF-CARE NEED ? ✓
1	Taking prescribed medicine(s), injection(s), etc ✓
2	Managing appliances (calipers, trusses etc.)
3	Managing discharging sinuses, colostomy and other surgical openings
4	Managing incontinence (uncontrolled bladder or bowel)
5	Managing epilepsy
6	Need for special precautions e.g. bleeding, fragile bone diseases, risk of pressure sores etc.
7	Dependence on machines e.g. respirator, kidney machine (state)
8	Other (state)*

	B. MOVING AROUND AT HOME ? ✓		H. SELF ORGANISATION ? ☐
1	Stairs	✓	1 Mental retardation or other intellectual disability
2	Steps		2 Emotional disorder
3	On level		3 Behavioural disorder
4	Doors and passages		4 Memory disturbance
5	Seeing things in way		5 Space or time confusions, etc.
6	Finding way around		6 Danger to self or others
7	Falling	✓	7 Reduced consciousness
8	Sit/stand: stand/sit	✓	8 Reduced responsibility e.g. leaves gas on, wanders off
9	On/off bed		9 Other (state)*
10	In/out garden		
11	Using switches, windows etc.	✓	
12	Reaching and picking things up	✓	
13	Other (state)*		

	C. COMMUNICATION ? ☐		I. EMPLOYMENT (because of handicap) ? ☐
1	Hearing		1 Finding suitable work
2	Talking		2 Transport to and from work
3	Writing		3 Premises at work
4	Reading		4 Communication problems at work
5	Answering door	✓	5 Fatigue
6	Talking with strangers		6 Unwelcome
7	Talking with family		7 Need time off (sickness) etc
8	Using telephone		8 Other (state)*
9	Contacting G.P. and other services		
10	Getting help in an emergency		
11	Other (state)*		

	D. HOME CARE ? ✓		J. EDUCATION (because of handicap) ? ☐
1	Light cleaning		1 Transport
2	Thorough cleaning	✓	2 Premises
3	Light kitchen work		3 Special education needs
4	Major kitchen work	✓	4 Special help needs
5	Bed making	✓	5 Unwelcome to staff
6	Washing (laundry)	✓	6 Unwelcome to fellow students
7	Minor repairs		7 Other (state)*
8	Decorating and maintenance		
9	Cleaning windows	✓	
10	Garden care	✓	
11	Shopping	✓	
12	Other (state)*		

	E. FAMILY CARE ? ☐ (other than of unhandicapped spouse)		K. OTHER ACTIVITIES (state) ? ☐
1	Child care at home		
2	Nursing of sick child or relative		
3	Escorting family		
4	Supervising family activities		
5	Communicating with and for family		
6	Other (state)*		

SECTION III HELP NEEDED AS RESULT OF HANDICAP (Services and equipment)

Tick "Has" if has and is satisfied. Tick "Wants" if has not, but wants. Tick "Has" and "Wants" if has, but is not satisfied: e.g. service inadequate, equipment is broken or its service is unreliable.

A. PERSONAL HELP AND SERVICES

		Has	Wants
1	Shopping	✓	
2	Collection of pension	✓	
3	– medicines	✓	
4	– other (state)*		
5	Library service		
6	Occasional transport	✓	
7	Home help		
8	Meals on wheels		
9	Laundry (launderette service	✓	
10	House maintenance	✓	
11	Garden maintenance	✓	
12	Social outings	✓	
13	Visitors	✓	
14	Better contact with G.P.	✓	
15	District nurse		
16	Health visitor		
17	Physiotherapy		
18	Chiropody at home		
19	Chiropody at clinic		
20	Services for the deaf		
21	Services for the blind		
22	Speech & communication training		
23	Social worker		
24	Occupational therapist		
25	Other (state)*		
	ADVICE ON:		
26	cash benefits, rebates, etc.		
27	services		
28	aids and equipment		
29	mobility		
30	education		
31	employment		
32	holidays		
33	recreation		
34	housing		
35	own disorder or handicap	✓	
36	special voluntary organisations		
37	other (state)*		
	REGULAR PERSONAL HELP FOR:		
38	mobility in house		
39	dressing		
40	toilet		
41	bathing	✓	
42	foot care	✓	
43	feeding		
44	injections		
45	surgical dressings, etc.		
46	appliances		
47	other (state)*		
	FREQUENCY OF HELP NEEDED:		
48	less than once a week		
49	once a week		
50	twice a week		
51	once a day		
52	twice a day		
53	through the day	✓	
54	in the night		
55	other (state)*		
	SPECIAL CENTRE NEEDED:		
56	Luncheon/Social Club		
57	Day, occupation/work centre		
58	Sheltered employment		
59	Sheltered housing		
60	Hotel residential		
61	Other (state)		

B. EQUIPMENT OR ITS MAINTENANCE

	MOBILITY	Has	Wants
1	Mobility aid outside the house (stick, long cane)		
2	Guide dog		
3	Mobility aid inside the house		
4	Ramps and rails outside house		
5	Ramps and rails inside house	✓	
6	Special handles, switches, etc)		
7	Lift between floor levels		
8	Hoist (floor ceiling etc.)		
9	Wheelchair, push		
10	Wheelchair, self propelled		
11	Motorised wheelchair (indoor)		
12	Motorised wheelchair (Outdoor)		
13	Pedal Tricycle		
14	Motorised tricycle ('invacar')		
15	Car or van	✓	
16	Car or van modification		
17	Exemption from vehicle excise duty		
18	Parking badge scheme		✓
19	Garage or garage modification	✓	
20	Mobility allowance		
	HOUSING AND HOME FACILITIES		
21	House modification or addition		
22	Rehousing	✓	
23	Household heating	✓	
24	Household laundry		
25	Kitchen aids or modification		
26	Bath/shower aids or modification		✓
27	Toilet aids or modification		
28	Commode chemical toilet		
	COMMUNICATION		
29	Hearing aid		
30	Voice magnifier		
31	Telephone or telephone adaptation	✓	
32	Typewriter		
33	Communication board		
34	Visual magnifier		
35	Large print book		
36	Talking book		
37	Braille equipment		
38	Call or alarm system		
39	Control system		
	PERSONAL EQUIPMENT		
40	Aids for dressing		
41	– reaching		
42	– feeding		
43	– other (state)*		
44	Special clothing		
45	Special footwear		
46	Elastic stockings		
47	Truss, brace, corset, caliper, etc.		
48	Artificial limb		
49	Bedpan		
50	Urinal (bottle)		
51	Fitted external urinary appliance		
52	Catheters, collecting bags for bladder, etc.		
53	Fitted bowel appliance (including colostomy, etc.)		
54	Absorbent pads		
55	Waterproof bedding etc.		
56	Waterproof clothing		
57	Soiled laundry facilities		
58	Disposal system for dressings, absorbencies, etc.		
59	Special life machines: – (respirator, kidney machine, aspirator, pacemaker, oxygen etc.)		
60	Other (state)*		

Appendix 3 .1 : Tabulated list of disability prevalence rates for polling districts in Barnet

Ward	Polling District Reference No.	Prevalence per 1000 Resident Population*
Arkley	1	3.76
	2	9.28
	3	18.15
	4	15.08
	5	9.45
	6	25.46
	7	20.47
Brunswick Park	19	16.21
	20	17.57
	21	19.11
	22	12.62
	23	6.56
Burnt Oak	81	14.83
	82	57.14
	83	57.46
	84	40.08
Child's Hill	61	7.85
	62	7.32
	63	6.17
	64	15.41
Colindale	78	36.47
	79	23.49
	80	16.97
East Barnet	14	21.60
	15	17.17
	16	10.71
	17	18.90
	18	7.84
Edgware	95	4.31
	96	20.89
	97	21.14
	98	21.56
East Finchley	46	11.31
	47	13.01
	48	15.42
	49	9.47
	50	12.24
Finchley	51	11.41
	52	7.60
	53	12.79
	54	13.27

Friern Barnet	24	11.68
	25	12.29
	26	21.06
	27	10.94
	28	3.67
Garden Suburb	55	19.99
	56	8.83
	57	5.70
	58	9.52
	59	5.66
	60	6.86
Golders Green	65	6.53
	66	8.41
	67	17.03
Hadley	8	16.73
	9	20.11
	10	14.84
	11	16.86
	12	10.57
	13	16.77
Hale	90	30.23
	91	24.15
	92	24.11
	93	15.98
	94	27.44
Hendon	73	15.70
	74	14.02
	75	7.23
	76	29.89
	77	27.56
Mill Hill	85	10.14
	86	18.70
	87	14.28
	88	14.40
	89	28.97
St. Pauls	42	18.01
	43	12.28
	44	15.05
	45	14.13
Totteridge	29	6.54
	30	4.81
	31	2.39
	32	8.64
	33	5.75
	34	10.03
West Hendon	68	23.88
	69	14.26
	70	8.03
	71	14.34
	72	48.57

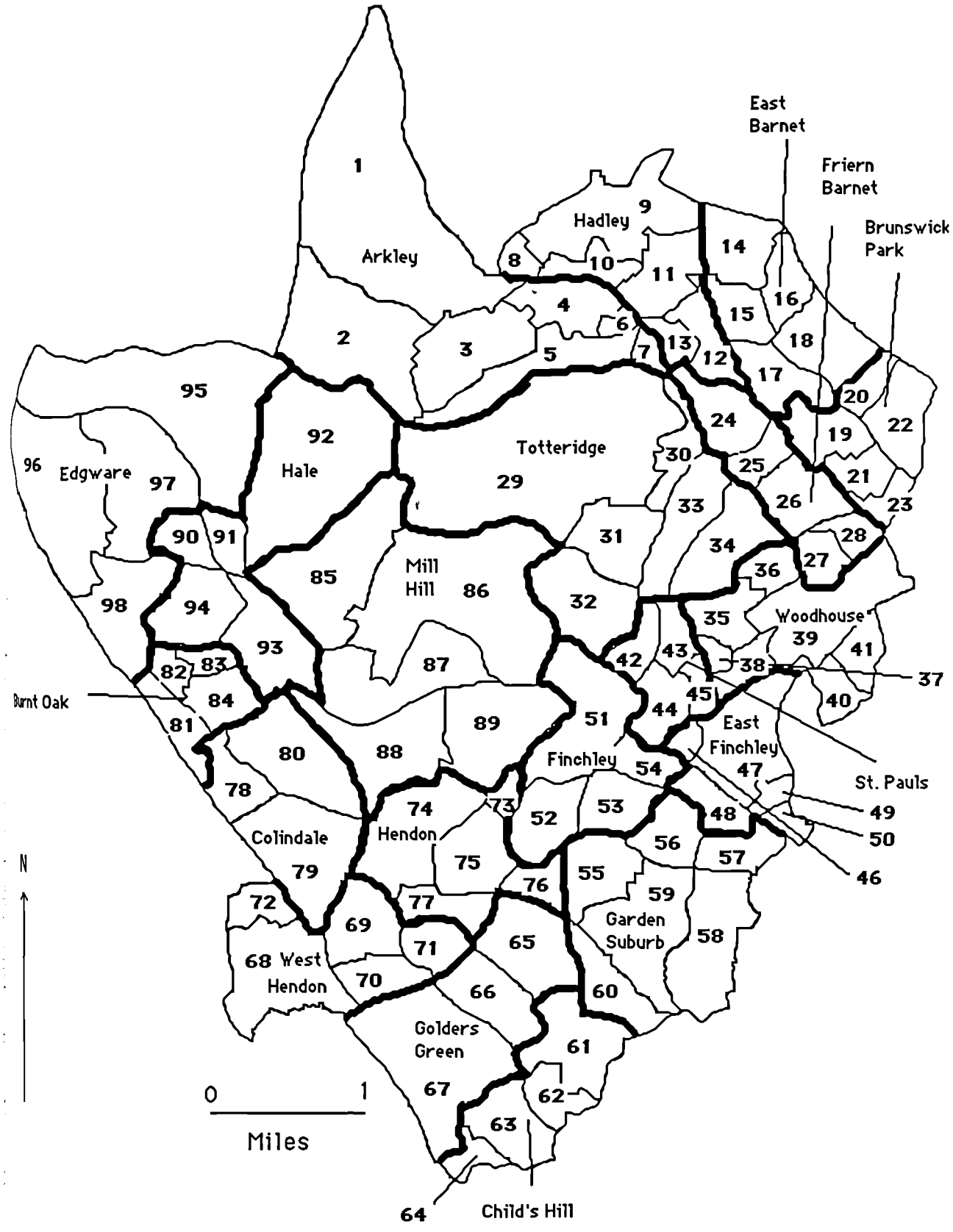
Woodhouse	35	17.37
	36	15.38
	37	0.73
	38	20.80
	39	19.28
	40	0.00
	41	0.34

* Based on 1981 Census Small Area Statistics collection, aggregated from enumeration districts to polling districts

Source : Original Data

ppendix 3.2: Ward and polling district boundries with codings

THE LONDON BOROUGH OF BARNET



Appendix 4 : Tabulated list of disorders suffered by 20 or more people in Barnet

Disorder	No. of people suffering disorder
Other & unspecified Arthritis	1111
Blindness & low vision	780
Deafness	709
Senility	533
Osteoarthritis	447
Cerebral Vascular Disease	351
Heart Disease	339
Bronchitis	335
Hypertension	323
Angina	296
Cataracts	282
Rheumatoid Arthritis	257
Diabetes Mellitus	224
Myocardinal Infarction	181
Asthma	154
Rheumatism	135
Hernia	134
Unspecified back disorders	129
Mental retardation	119
Skin ulcers	113
Multiple Sclerosis	108
Epilepsy	107
Unspecified joint disorders	107
Emphysema	101
Ill-defined & unknown causes (Chest)	99
Parkinson's Disease	87
Urinary system disorders	79
Leg(s) amputation	75
Artherosclerosis	73
Fractured femur	65
Neurotic disorders - "Nerves"	62
Depression	58
Limb deformities	58
Neoplasms	57
Glaucoma	54
Musculoskeletal congenital abnormality	49

Varicose veins of lower extremities	48
Cerebral Palsy	45
Kidney disorders	47
Thrombosis	46
Phlebitis	43
Chromosomal congenital abnormality	41
Unspecified brain disorders	41
Anemia	40
Thyroid disorders	39
Unspecified paralysis	38
Bladder disorders	38
Curvature of the spine	37
Prostate gland disorders	36
Unspecified lung disorders	35
Unspecified intestinal disorders	35
Ankylosing Spondylitis	34
Unspecified mental illness	32
Water retention	31
Unspecified stomach disorders	29
Diverticulitis	26
Spina Bifida	22
Migraine	21
Unspecified disorders of nervous system	21
Unspecified disorders of bone & cartilage	20
Vertigo	20

Source : Original Data, based on responses from people with disabilities. No specialist verification of diagnosis has been obtained.

Appendix 5 : Number of People with Severe, Moderate, and Slight Disability for Polling Districts in Barnet

Polling District	Number of People with Disability:- Slight	Moderate	Severe
1	0	2	0
2	2	8	2
3	22	59	7
4	11	46	7
5	15	33	1
6	18	37	2
7	11	26	0
8	9	17	3
9	26	58	0
10	7	23	4
11	38	85	12
12	21	44	3
13	12	24	3
14	15	36	2
15	32	67	2
16	19	35	3
17	20	49	2
18	10	20	1
19	27	65	5
20	22	41	1
21	12	30	1
22	17	47	4
23	5	12	0
24	22	41	2
25	15	38	1
26	48	98	4
27	11	21	3
28	2	5	0
29	1	3	1
30	1	16	4
31	1	6	0
32	7	19	1
33	7	19	0
34	12	33	3
35	11	32	7
36	11	16	0
37	1	2	0
38	12	34	6

Polling District	Number of People with Disability :- Slight	Moderate	Severe
39	8	25	1
40	0	0	0
41	0	1	0
42	26	39	2
43	27	50	4
44	46	61	0
45	30	56	6
46	15	18	0
47	33	48	0
48	22	34	0
49	27	39	0
50	18	27	0
51	36	68	2
52	14	18	1
53	21	28	0
54	23	40	1
55	27	44	0
56	13	18	0
57	8	9	0
58	8	11	0
59	12	23	0
60	12	17	0
61	25	35	0
62	16	23	0
63	8	17	0
64	18	31	0
65	22	33	1
66	30	39	0
67	60	84	0
68	42	67	0
69	39	75	6
70	6	18	1
71	8	26	2
72	29	55	3
73	7	14	2
74	22	61	2
75	15	27	2
76	25	48	0
77	67	123	13
78	28	43	2
79	58	113	6
80	80	148	12
81	44	77	2
82	50	76	2
83	71	133	2

Polling District	Number of People with Disability :- Slight	Moderate	Severe
84	92	189	13
85	8	22	2
86	19	34	3
87	43	83	4
88	24	36	4
89	22	64	3
90	85	142	5
91	18	32	2
92	17	34	0
93	5	13	0
94	67	107	3
95	1	2	1
96	39	79	5
97	69	105	6
98	52	67	9

Source : Original Data

Appendix 6 : Tabular List of Standardised Residuals from Final Regression Model

Polling District	---- Residuals ---- Model 1	Model 2	Model 3	Model 4
1	-0.16452	-0.01759	-0.14415	-0.25153
2	-0.12063	0.00038	-0.13382	-0.17535
3	0.75256	-0.67820	-0.92672	-0.25245
4	-0.08478	-0.06104	-0.13509	0.14931
5	-0.05953	-1.95078	-2.17148	-1.50819
6	0.33830	0.78451	0.69845	0.78752
7	0.03258	0.28622	0.14088	0.24997
8	-0.07463	0.29038	0.35762	0.16397
9	0.25579	0.79879	0.74533	1.00724
10	-0.42300	-0.06744	-0.17502	-0.08375
11	0.12767	0.45367	0.59008	0.53290
12	-0.43021	-0.13114	-0.26529	0.07911
13	0.03404	0.27489	0.14235	0.22038
14	0.64217	-0.20980	-0.39557	-0.07759
15	0.40198	0.24293	0.14478	0.62058
16	0.02872	-0.12882	-0.27890	-0.01782
17	-0.04988	0.48915	0.45459	0.63215
18	-0.38326	-0.38960	-0.54926	-0.39032
19	-0.07758	0.05675	-0.15789	0.46088
20	0.33999	0.58602	0.44789	0.43374
21	0.29525	0.61453	0.44927	0.57202
22	-0.31410	0.02374	-0.09591	0.23212
23	-0.53588	-0.77930	-0.83497	-0.80444
24	-0.58500	-0.18640	-0.29394	-0.00804
25	-0.10950	-0.19749	-0.26104	-0.07688
26	0.29553	0.24367	0.02942	0.48467
27	-0.39714	-0.10620	0.03987	-0.13690
28	-0.36703	-0.25593	0.13875	-0.42536
29	-0.17997	0.03153	-0.09402	-0.19926
30	-1.32106	-1.10802	-1.24421	-1.04791
31	-0.50622	-0.75875	-0.92157	-0.84642
32	-0.41126	-0.21459	-0.36032	-0.24987
33	-1.09478	-1.12199	-1.20008	-1.03057
34	-0.92488	-0.95489	-0.74398	-0.74920
35	0.06810	0.20277	0.20711	0.23763
36	-0.16522	0.15532	0.19379	0.03794
37	-1.40640	-1.43737	-1.61509	-1.46913
38	0.38120	-0.14920	-0.11129	-0.04522
39	0.28255	0.55492	0.54889	0.47115
40	-0.88741	-1.62805	-1.65427	-1.65302
41	-1.29323	-2.06548	-2.18147	-2.02131
42	0.12701	0.41399	0.37301	0.48844
43	-0.46385	-0.25291	-0.08308	0.02399
44	-0.06861	0.13723	0.29077	0.46935
45	-1.43741	-0.31174	-0.19891	0.03325
46	-0.09780	-0.09324	-0.11391	-0.12577
47	-0.52276	-0.65996	-0.86667	-0.34661
48	0.05160	0.37911	0.68403	0.40904
49	-1.02816	-1.65742	-1.53757	-1.30013
50	-0.28904	-0.45523	-0.19008	-0.37757
51	-1.18911	-0.93375	-0.52712	-0.60603
52	-0.71909	-0.47514	-0.46847	-0.48363
53	-0.00304	0.22867	0.55898	0.22031
54	-0.37608	-0.40188	-0.25958	-0.20338
55	-1.21875	-0.21849	-0.06256	-2.49636
56	-0.82170	-0.44386	-0.58918	-0.45676
57	-0.84643	-0.50096	-0.65307	-0.59531

Polling District	---- Residuals ---- Model 1	Model 2	Model 3	Model 4
58	-0.20320	0.03927	-0.07930	-0.11180
59	-1.24194	-1.13960	-0.94601	-1.22762
60	-0.76545	-0.49104	-0.05167	-0.50721
61	-1.63149	-1.06548	-0.41437	-0.82518
62	-1.41144	-2.45995	-2.46363	-2.15670
63	-1.02725	-0.88737	-0.73433	-0.84803
64	0.32788	-0.16847	0.53256	-0.09144
65	-1.95987	-1.68272	-1.30684	-1.38041
66	-1.17590	-0.75093	-0.48167	-0.51411
67	-0.07034	-0.56708	-0.59979	0.10151
68	1.71798	1.12331	1.33146	0.62893
69	-0.30021	0.01890	0.35428	-0.16398
70	-0.30309	-0.92470	-1.00664	-0.87033
71	-0.14367	0.16302	0.05426	-0.30410
72	1.05565	0.91519	0.77214	1.08742
73	-0.09057	0.20901	0.12582	0.06403
74	-0.04511	0.19352	0.28937	0.51767
75	-1.50528	-2.16130	-2.04327	-2.07218
76	0.58093	1.17649	1.34688	1.23347
77	1.36416	1.86849	1.82458	-0.40021
78	0.77718	1.07617	0.95909	1.09788
79	1.23185	1.80813	1.80122	2.44454
80	3.12102	0.64697	0.46132	-0.79276
81	-0.27948	-1.53155	-1.63330	-1.07267
82	2.26047	1.98567	1.82213	2.46748
83	3.82778	3.32516	3.18343	2.97821
84	2.96767	1.48338	1.17269	1.11321
85	-0.15239	-0.10133	-0.23830	-0.12279
86	-0.55049	0.11304	0.20679	0.18026
87	0.75528	-0.06800	-0.18584	-0.84607
88	0.04836	0.28757	0.22890	0.23128
89	1.07563	1.49075	1.41893	1.78039
90	1.72496	1.53416	1.41485	0.95010
91	0.50861	0.58953	0.47189	0.57028
92	0.75972	0.74152	0.60784	0.72089
93	0.09982	0.56703	0.57870	0.71889
94	1.98326	3.02121	3.54572	3.70466
95	-0.16587	-0.03460	-0.16201	-0.26610
96	1.02701	0.21379	0.00908	0.49153
97	1.77726	1.31467	1.16945	0.58821
98	1.09543	2.05326	2.06177	2.11309

Appendix 7 : Difference Between Felt Need for Services and Provision for Selected Services

Key

cashh	No. having advice on cash benefits, rebates etc.
casht	No. wanting advice on cash benefits, rebates etc (has + wants but doesn't have)
homehlph	No. having home help service
homehlpt	No. wanting home help service
kitchh	No. having a kitchen aid or modification
kitcht	No. wanting a kitchen aid or modification
bathh	No. having a bath/shower aid or modification
batht	No. wanting a bath/shower aid or modification
toilh	No. having a toilet aid or modification
toilt	No. wanting a toilet aid or modification
teleh	No. having a telephone or telephone adaptation
telet	No. wanting a telephone or telephone adaptation
dressh	No. having an aid for dressing
dresst	No. wanting an aid for dressing
reachh	No. having an aid for reaching
reacht	No. wanting an aid for reaching
feedh	No. having an aid for feeding
feedt	No. wanting an aid for feeding

Source : Original Data

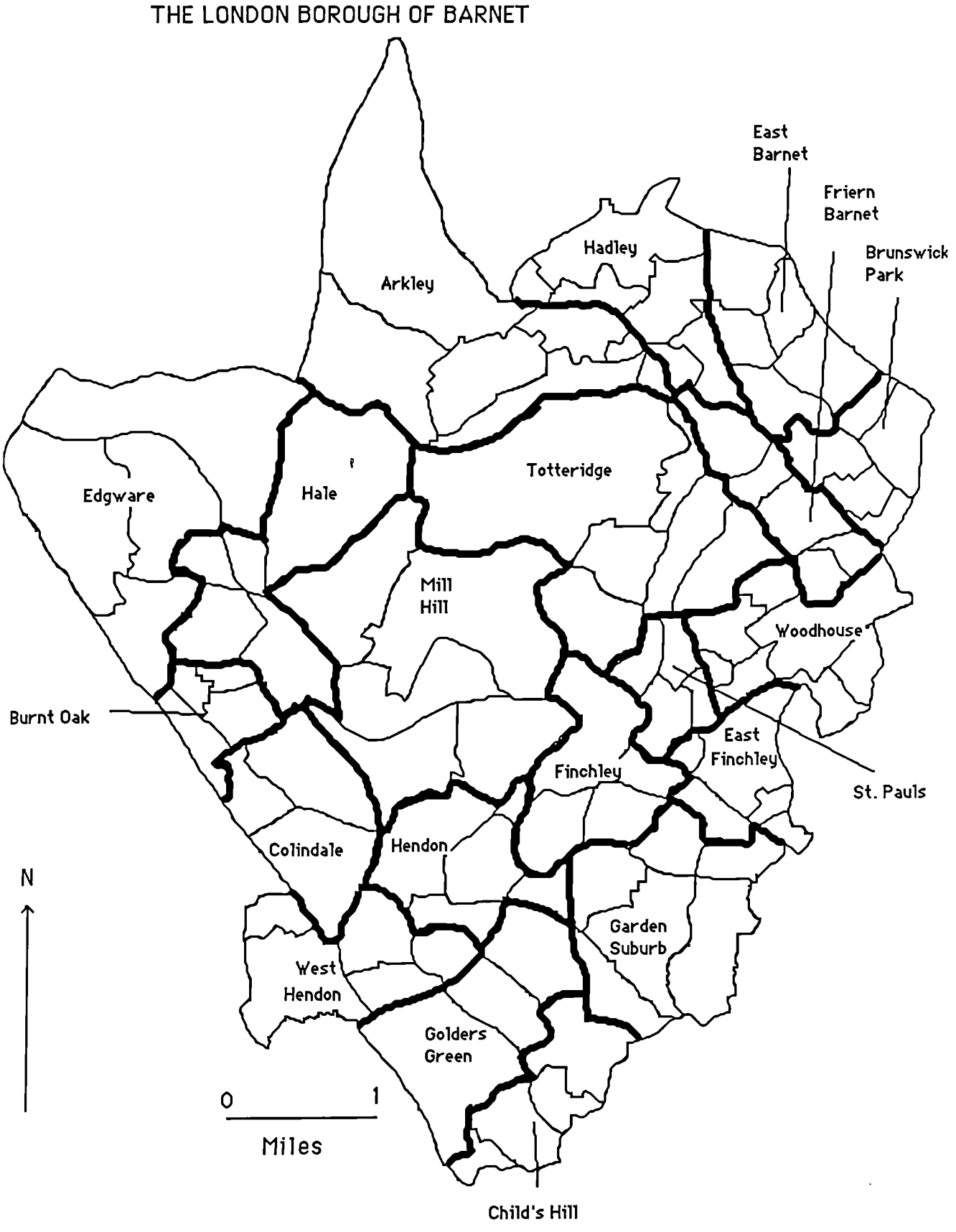
Poll. Dist.	cashh	casht	homehlph	homhelpt	kitchh	kitcht	bathh	batht
1	0	0	0	0	0	0	0	0
2	3	7	3	4	2	2	0	3
3	15	32	11	15	2	9	13	28
4	5	27	8	15	0	16	8	26
5	16	21	11	11	0	0	11	14
6	15	24	8	10	0	3	8	16
7	2	6	14	15	0	0	6	8
8	4	7	4	5	1	1	4	7
9	7	28	9	15	1	3	9	21
10	11	15	8	10	0	1	3	9
11	16	36	30	34	4	6	24	37
12	9	24	11	20	1	4	13	21
13	2	13	1	5	1	4	4	7
14	17	22	2	7	1	2	13	18
15	28	47	11	18	0	5	14	29
16	19	26	6	7	0	1	9	20
17	30	41	10	22	3	6	22	31
18	6	6	4	4	0	0	5	5
19	25	38	12	16	0	0	20	27
20	16	22	8	12	1	1	10	15
21	18	24	4	5	0	0	5	10
22	13	34	8	13	0	4	7	25
23	10	11	2	2	0	0	2	8
24	7	14	8	10	0	1	19	20
25	4	19	9	17	2	2	18	24
26	18	50	29	38	7	9	40	54
27	2	4	2	3	1	1	8	13
28	0	4	0	1	0	0	3	3
29	0	1	1	1	0	0	0	0
30	8	11	3	4	1	1	8	9
31	4	4	0	2	0	0	1	1
32	15	18	6	8	1	5	6	12
33	12	14	8	9	0	0	3	7
34	10	14	11	14	3	6	6	9
35	8	19	4	15	0	8	9	20
36	0	0	3	4	0	0	2	5
37	1	2	0	0	0	2	0	2
38	21	22	1	1	0	0	3	7
39	6	10	7	9	0	1	3	8
40	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	1	1
42	9	9	6	8	0	1	3	11
43	18	29	8	13	0	3	4	16
44	15	22	11	17	0	0	16	21
45	14	20	15	16	2	5	12	20
46	3	7	2	2	0	0	3	8
47	9	14	17	22	1	2	15	19
48	6	12	5	8	0	0	3	6
49	2	7	10	11	0	0	3	9
50	2	4	4	5	0	0	5	10
51	21	28	16	20	1	2	14	24
52	2	4	5	7	1	1	4	4
53	17	19	4	4	3	3	8	10
54	6	15	7	13	0	2	9	17
55	21	22	11	14	1	1	15	18

Poll. Dist.	cashh	casht	homehlph	homhelpt	kitchh	kitcht	bathh	batht
56	4	7	1	6	0	0	3	6
57	2	3	2	5	0	0	1	1
58	0	1	0	6	0	0	1	2
59	4	5	4	7	0	0	7	8
60	6	14	0	4	0	1	4	4
61	10	14	4	10	2	2	11	13
62	2	3	5	8	0	0	7	12
63	9	10	1	2	0	0	4	6
64	3	13	2	4	0	1	8	10
65	6	12	3	10	1	1	7	9
66	10	10	6	11	0	0	12	14
67	30	37	10	19	1	2	17	25
68	25	29	8	14	2	4	13	20
69	8	18	16	26	1	1	25	39
70	4	6	3	4	0	0	7	9
71	5	8	7	12	0	1	7	8
72	36	37	7	8	0	0	13	16
73	6	9	2	6	0	0	2	6
74	11	15	14	21	0	2	14	19
75	5	7	6	10	1	1	3	7
76	4	7	7	15	2	4	11	15
77	30	42	36	58	1	6	36	57
78	28	34	5	9	0	0	15	22
79	86	87	21	26	1	1	17	21
80	72	73	25	29	4	4	66	69
81	31	43	13	13	1	3	24	33
82	23	46	11	14	0	3	17	29
83	53	83	32	42	5	17	33	65
84	65	107	42	54	5	11	50	77
85	4	13	9	11	0	0	4	9
86	5	17	11	14	0	0	9	13
87	49	60	12	18	3	4	35	47
88	17	21	1	4	0	0	12	20
89	38	44	7	18	3	3	17	27
90	35	88	9	13	2	2	31	37
91	2	8	4	7	0	0	7	12
92	18	20	5	12	1	1	7	10
93	8	11	3	5	2	2	6	8
94	46	49	15	16	0	0	28	29
95	0	0	0	0	0	0	0	1
96	43	54	17	31	3	11	21	40
97	54	67	10	18	5	5	42	55
98	35	52	26	40	5	6	27	37

Poll. dist.	toilh	toilt	toleh	telet	dressh	dresst	reachh	reacht	feedh	feedt
1	0	0	0	0	0	0	0	0	0	0
2	1	2	7	7	0	1	2	3	1	1
3	7	17	32	38	1	7	7	13	0	3
4	4	19	15	18	0	17	4	22	0	6
5	4	5	20	20	0	5	1	3	0	0
6	3	5	22	25	0	1	1	8	0	1
7	2	2	8	10	1	2	8	10	0	0
8	2	3	5	6	2	2	3	5	1	1
9	3	5	16	21	1	1	7	16	0	1
10	2	4	13	14	2	2	5	6	1	1
11	12	19	34	39	2	8	7	13	3	5
12	3	8	22	25	0	2	2	13	1	4
13	2	4	14	20	2	2	1	4	1	2
14	6	8	17	24	1	9	2	6	0	0
15	4	8	40	54	2	2	2	20	0	0
16	2	5	26	26	0	4	1	13	0	0
17	5	8	28	35	3	3	5	24	0	1
18	1	1	8	10	2	3	3	6	0	1
19	8	10	49	53	1	3	4	11	0	0
20	3	6	32	33	3	3	5	9	0	0
21	1	1	20	23	0	8	2	7	0	0
22	5	5	27	32	0	0	4	14	1	1
23	3	5	8	8	0	1	2	5	0	0
24	4	4	34	35	3	4	5	9	0	1
25	5	6	31	35	3	5	5	9	0	0
26	15	20	72	77	3	3	11	24	1	1
27	3	3	10	10	0	0	3	4	1	1
28	1	1	3	5	0	0	0	0	0	0
29	0	0	3	3	0	0	1	1	0	0
30	4	4	14	14	0	3	2	3	0	2
31	0	0	6	6	0	0	0	0	0	0
32	3	3	1	5	4	7	7	16	1	3
33	3	3	15	15	1	8	0	3	0	1
34	9	11	10	11	3	4	8	15	3	5
35	1	6	14	17	1	2	3	13	0	5
36	2	3	5	5	0	0	3	3	0	0
37	0	1	0	0	0	0	0	2	0	1
38	3	6	22	24	0	0	2	7	0	0
39	5	6	19	20	2	2	4	10	0	0
40	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	2	0	0	0	0
42	0	1	12	13	2	4	2	2	1	1
43	1	4	20	20	1	2	1	3	1	1
44	4	6	34	38	0	0	2	5	0	0
45	6	6	22	24	1	1	1	5	0	1
46	1	2	13	14	0	0	0	1	0	0
47	3	6	38	40	1	1	1	1	1	1
48	3	5	27	28	1	1	1	1	0	0
49	1	2	24	25	0	1	2	2	0	0
50	2	2	20	21	0	1	0	0	0	0
51	6	14	28	28	1	2	2	11	1	2
52	2	2	16	16	0	3	2	4	0	0
53	3	3	17	18	0	0	3	5	1	1
54	3	5	23	25	0	0	1	5	2	2
55	8	9	36	38	1	1	3	3	0	0

Poll. dist.	toilh	toilt	teleh	telet	dressh	dresst	reachh	reacht	feedh	feedt
56	0	1	18	18	0	0	0	0	0	0
57	1	1	9	9	0	0	0	0	0	0
58	0	1	11	11	0	0	0	0	0	0
59	3	3	20	20	1	1	4	4	0	0
60	2	2	15	15	2	2	1	2	1	1
61	2	2	31	32	1	2	2	3	0	0
62	4	4	20	20	0	0	1	1	0	0
63	1	2	14	15	0	0	2	2	1	2
64	1	1	18	24	0	0	0	0	0	0
65	3	4	26	26	0	0	1	2	0	0
66	3	4	36	36	0	0	1	1	0	0
67	4	4	63	65	1	2	5	6	0	0
68	5	5	37	40	1	1	1	3	0	0
69	7	8	47	50	1	1	10	15	3	3
70	3	3	12	13	0	0	0	0	1	1
71	3	3	25	25	1	1	4	6	0	0
72	4	6	38	40	1	2	2	2	0	0
73	1	1	14	14	0	0	1	5	0	0
74	9	15	41	42	0	1	1	2	0	0
75	2	5	20	21	0	0	2	3	0	0
76	3	6	35	38	0	1	3	4	0	2
77	5	10	85	88	2	8	10	27	1	3
78	5	6	27	30	0	0	7	7	0	0
79	16	16	88	94	2	2	5	5	0	0
80	33	39	126	131	2	4	8	10	1	2
81	10	11	35	39	1	1	4	5	1	1
82	5	12	26	35	0	2	2	12	0	0
83	15	26	57	66	3	4	7	19	1	1
84	18	30	105	124	3	3	15	34	2	4
85	0	0	18	20	0	0	1	1	0	0
86	5	7	28	28	2	4	0	3	0	0
87	9	16	62	72	0	0	4	8	1	1
88	3	8	26	26	0	0	0	2	0	0
89	3	8	32	33	0	0	2	9	0	0
90	17	17	116	116	2	2	7	8	1	1
91	2	4	26	27	1	1	2	4	0	0
92	2	2	29	29	0	0	0	0	0	0
93	4	4	12	12	1	1	0	0	0	0
94	11	13	89	93	3	3	11	11	0	0
95	0	1	0	2	0	0	0	0	0	0
96	10	26	58	63	1	4	14	21	2	3
97	17	22	78	90	3	7	8	8	0	0
98	13	24	64	66	3	5	6	6	1	1

Appendix8 : Overlay of ward and polling district boundries



Appendix 9 : Tabular List of Basic Data used in the Study by Polling District

Key

1	No. of disabled people interviewed
2	Prevalence of disability per 1000 resident population based on 1981 census
3-7	Total resident population by age groups
8-12	Percentage of total population in each age group
13	Total resident population living in private households
14	Total resident population living in council rented tenure
15	Total resident population living in private rented tenure
16	Total resident population living in elderly person's homes
17	Total resident population living in other tenures
18	Total economically active population working in manufacturing or construction
19	Total households whose head's occupation is professional or managerial (Registrar General's Classes I or II)
20	Total households whose head's occupation is skilled manual or non-manual (IIIM & N)
21	Total households whose head's occupation is semi or unskilled manual (IV & V)
22	Total resident population of Pakistan & New Commonwealth origin
23	Total Households having no access to a car
24	Total households sharing one or both an inside W.C. and bath
25	Total residents unemployed
26	Total residents living at densities above 1.5 per room

27	No. disabled people suffering from arthritis
28	No. disabled people suffering from sight disorders
29	No. disabled people suffering from circulatory disorders
30	No. disabled people suffering from lung disorders
31	No. disabled people suffering from heart disorders
32	No. disabled people suffering from cerebral haemorrhage
	No. of disabled people predicted to be suffering from selected disorders based on an age structure model (Chapter 8)-
33	Arthritis
34	Lung disorders
35	Heart disorders
36	Strokes
	"Standardised morbidity ratios" for-
37	Lung Disorders
38	Heart Disorders
39	Strokes
40-44	No. disabled people predicted in standard age groups using an age structure model (Chapter 8)
45-48	No. disabled people predicted as living in council rented tenure and age groups using age/tenure model
49-51	No. disabled people predicted as living in "other" tenure and age groups using age/tenure model
52	Total no. disabled people predicted from age structure model
53	Total no. disabled people predicted from age/tenure model
54	No. people living in sheltered housing for the elderly

Source: 1981 Census, Small Area Statistics & Original Data

Polling District	1 no.dis	2 prev000	3 tot0-15	4 tot15-44	5 tot45-64	6 tot65-74	7 tot75+
1	2	3.7594	103	203	146	57	23
2	8	9.2807	158	324	252	86	42
3	59	18.1538	583	1215	978	331	143
4	46	15.0820	583	1220	723	335	189
5	44	9.4542	1273	2018	861	347	155
6	37	25.4646	272	531	367	174	109
7	26	20.4724	252	489	305	125	99
8	17	16.7323	221	356	273	92	74
9	58	20.1110	618	1185	573	309	199
10	23	14.8387	260	638	344	167	141
11	85	16.8584	897	2065	1228	530	322
12	45	10.5708	862	1805	1024	349	217
13	24	16.7715	282	540	369	151	89
14	36	21.5957	360	582	421	239	65
15	67	17.1663	824	1652	819	395	213
16	35	10.7132	679	1231	912	321	124
17	47	18.8983	513	969	619	194	192
18	20	7.8401	566	981	598	293	113
19	67	16.2110	757	1502	1081	519	274
20	41	17.5739	484	882	558	290	119
21	30	19.1083	317	653	382	136	82
22	47	12.6276	749	1434	914	409	216
23	12	6.5610	369	757	422	178	103
24	41	11.6809	655	1300	944	385	226
25	35	12.2893	726	1203	552	227	140
26	98	21.0617	898	1731	1081	583	360
27	21	10.9375	386	763	456	190	125
28	5	3.6657	255	673	277	104	55
29	3	6.5359	81	176	127	45	30
30	16	4.8149	663	1208	871	374	207
31	6	2.3914	607	1093	576	168	65
32	19	8.6442	478	857	517	231	115
33	19	5.7523	500	1529	768	310	196
34	33	10.0273	492	1383	779	400	237
35	32	17.3724	244	805	421	252	120
36	16	15.3846	169	401	266	122	82
37	2	0.7275	508	1119	660	301	161
38	34	20.7951	317	639	438	152	89
39	25	19.2752	248	565	307	113	64
40	0	0.0000	434	910	485	204	91
41	1	0.3452	513	1270	657	315	142
42	39	18.0139	394	844	583	205	139
43	50	12.2790	712	1887	836	390	247
44	61	15.0506	676	1819	863	447	248
45	56	14.1307	626	1705	841	399	392
46	21	11.3147	385	867	359	157	88
47	48	13.0081	713	1412	828	490	247
48	34	15.4195	421	1056	399	204	125
49	39	9.4683	887	1841	745	383	263
50	27	12.2449	324	987	514	241	139
51	68	11.4094	1080	2601	1274	607	398
52	18	7.6014	447	957	552	263	149
53	28	12.7912	392	1128	376	187	106
54	40	13.2714	555	1320	626	314	199
55	44	19.9909	331	716	493	334	327

Polling District	1 no.dis	2 prev000	3 tot0-15	4 tot15-44	5 tot45-64	6 tot65-74	7 tot75+
56	18	8.8322	384	800	438	252	164
57	9	5.6962	284	596	392	177	131
58	11	9.5156	257	463	276	98	62
59	23	5.6594	818	1631	940	453	222
60	17	6.8576	404	1108	591	225	151
61	35	7.8458	784	2060	858	439	320
62	23	7.3202	532	1263	706	389	252
63	17	6.1661	510	1168	603	296	180
64	31	15.4076	370	904	462	196	80
65	33	6.5256	1069	2003	1023	620	342
66	39	8.4052	988	2109	842	424	277
67	84	17.0316	970	1948	1191	483	340
68	81	23.8797	797	1599	649	233	114
69	75	14.2558	949	2254	1170	560	328
70	18	8.0285	515	942	514	175	96
71	26	14.4284	352	698	422	213	117
72	56	48.5690	271	391	282	104	105
73	14	15.6951	180	351	196	101	64
74	61	14.0198	812	1886	999	413	241
75	27	7.2289	661	1526	787	485	276
76	48	29.8879	303	702	304	171	126
77	123	27.5599	758	1744	1051	566	344
78	43	36.4716	232	523	243	98	83
79	114	23.4906	902	2019	1142	475	315
80	148	16.9705	2660	4338	1154	395	174
81	51	14.8299	817	1275	741	378	228
82	102	57.1429	358	599	470	203	155
83	169	57.4634	556	1018	788	329	250
84	190	40.0844	1066	1656	1103	471	444
85	22	10.1429	456	850	560	206	97
86	34	18.7019	283	701	410	220	204
87	83	14.2833	1498	2476	1137	482	218
88	24	14.3971	259	811	348	162	87
89	76	28.9745	393	1002	692	352	184
90	77	30.2316	472	979	680	309	107
91	32	24.1509	253	549	278	178	67
92	34	24.1135	266	527	410	162	45
93	49	15.9765	587	1337	694	270	179
94	136	27.4415	982	2043	1105	508	318
95	2	4.3103	78	167	120	75	24
96	79	20.8884	762	1488	924	417	191
97	105	21.1353	1296	2057	1012	407	196
98	128	21.5561	1208	2371	1304	670	385

Poll.	8 % tot-15	9 %tot-44	10 %tot-64	11 %tot-74	12 %tot75+
1	19.3609	38.1579	27.4436	10.7143	4.3233
2	18.3295	37.5870	29.2343	9.9768	4.8724
3	17.9385	37.3846	30.0923	10.1846	4.4000
4	19.1148	40.0000	23.7049	10.9836	6.1967
5	27.3528	43.3605	18.5002	7.4560	3.3305
6	18.7199	36.5451	25.2581	11.9752	7.5017
7	19.8425	38.5039	24.0157	9.8425	7.7953
8	21.7520	35.0394	26.8701	9.0551	7.2835
9	21.4286	41.0888	19.8682	10.7143	6.9001
10	16.7742	41.1613	22.1935	10.7742	9.0968
11	17.7906	40.9560	24.3554	10.5117	6.3864
12	20.2490	42.4007	24.0545	8.1983	5.0975
13	19.7065	37.7359	25.7862	10.5521	6.2194
14	21.5957	34.9130	25.2549	14.3371	3.8992
15	21.1120	42.3264	20.9839	10.1204	5.4573
16	20.7836	37.6798	27.9155	9.8255	3.7955
17	20.6273	38.9626	24.8894	7.8006	7.7201
18	22.1874	38.4555	23.4418	11.4857	4.4296
19	18.3160	36.3416	26.1553	12.5575	6.6296
20	20.7458	37.8054	23.9177	12.4303	5.1007
21	20.1911	41.5924	24.3312	8.6624	5.2229
22	20.1236	38.5277	24.5567	10.9887	5.8033
23	20.1750	41.3887	23.0727	9.7321	5.6315
24	18.6610	37.0370	26.8946	10.9687	6.4387
25	25.4916	42.2402	19.3820	7.9705	4.9157
26	19.2994	37.2018	23.2323	12.5296	7.7369
27	20.1042	39.7396	23.7500	9.8958	6.5104
28	18.6950	49.3402	20.3079	7.6246	4.0323
29	17.6471	38.3442	27.6688	9.8039	6.5359
30	19.9519	36.3527	26.2113	11.2549	6.2293
31	24.1929	43.5632	22.9574	6.6959	2.5907
32	21.7470	38.9900	23.5214	10.5096	5.2320
33	15.1378	46.2912	23.2516	9.3854	5.9340
34	14.9499	42.0237	23.6706	12.1544	7.2015
35	13.2465	43.7025	22.8556	13.6808	6.5147
36	16.2500	38.5577	25.5769	11.7308	7.8846
37	18.4794	40.7057	24.0087	10.9494	5.8567
38	19.3684	39.0826	26.7890	9.2966	5.4434
39	19.1210	43.5621	23.6700	8.7124	4.9345
40	20.4331	42.8437	22.8343	9.6045	4.2844
41	17.7080	43.8385	22.6786	10.8733	4.9016
42	18.1986	38.9838	26.9284	9.4688	6.4203
43	17.4853	46.3409	20.5305	9.5776	6.0653
44	16.6790	44.8803	21.2929	11.0289	6.1189
45	15.7961	43.0230	21.2213	10.0681	9.8915
46	20.7435	46.7134	19.3427	8.4591	4.7414
47	19.3225	38.2656	22.4390	13.2791	6.6938
48	19.0930	47.8912	18.0952	9.2517	5.6689
49	21.5344	44.6953	18.0869	9.2984	6.3850
50	14.6939	44.7619	23.3107	10.9297	6.3039
51	18.1208	43.6409	21.3758	10.1846	6.6779
52	18.8767	40.4138	23.3108	11.1064	6.2922
53	17.9077	51.5304	17.1768	8.5427	4.8424
54	18.4141	43.7956	20.7697	10.4180	6.6025
55	15.0386	32.5307	22.3989	15.1749	14.8569

Poll.	8 % tot-15	9 %tot-44	10 %tot-64	11 %tot-74	12 %tot75+
56	18.8420	39.2542	21.4917	12.3651	8.0471
57	17.9747	37.7215	24.8101	11.2025	8.2911
58	22.2318	40.0519	23.8754	8.4775	5.3633
59	20.1280	40.1329	23.1299	11.1467	5.4626
60	16.2969	44.6954	23.8403	9.0762	6.0912
61	17.5745	46.1780	19.2334	9.8408	7.1733
62	16.9319	40.1973	22.4698	12.3806	8.0204
63	18.4984	42.3649	21.8716	10.7363	6.5288
64	18.3897	44.9304	22.9622	9.7416	3.9761
65	21.1390	39.6085	20.2294	12.2602	6.7629
66	21.2931	45.4526	18.1466	9.1379	5.9698
67	19.6675	39.4972	24.1484	9.7932	6.8938
68	23.4965	47.1403	19.1333	6.8691	3.3608
69	18.0384	42.8436	22.2391	10.6444	6.2346
70	22.9706	42.0161	22.9260	7.8055	4.2819
71	19.5339	38.7347	23.4184	11.8202	6.4928
72	23.5039	33.9115	24.4579	9.0199	9.1067
73	20.1794	39.3498	21.9731	11.3229	7.1749
74	18.6624	43.3464	22.9602	9.4921	5.5390
75	17.6975	40.8568	21.0709	12.9853	7.3896
76	18.3667	43.7111	18.9290	10.6476	7.8456
77	16.9841	39.0769	23.5492	12.6821	7.7078
78	19.6777	44.3596	20.6107	8.3121	7.0399
79	18.5864	41.6031	23.5318	9.7878	6.4908
80	30.5011	49.7420	13.2324	4.5293	1.9952
81	23.7569	37.0747	21.5470	10.9916	6.6298
82	20.0560	33.5574	26.3305	11.3725	8.6835
83	18.9051	34.6141	26.7936	11.1867	8.5005
84	22.4895	34.9367	23.2700	9.9367	9.3671
85	21.0235	39.1886	25.8184	9.4975	4.4721
86	15.5666	38.5589	22.5523	12.1012	11.2211
87	25.7787	42.6088	19.5663	8.2946	3.7515
88	15.5369	48.6503	20.8758	9.7181	5.2190
89	14.9828	38.2005	26.3820	13.4197	7.0149
90	18.5316	38.4374	26.6981	12.1319	4.2010
91	19.0943	41.4340	20.9811	13.4340	5.0566
92	18.8652	37.3759	29.0780	11.4894	3.1915
93	19.1392	43.5931	22.6280	8.8034	5.8363
94	19.8144	41.2228	22.2962	10.2502	6.4165
95	16.8103	35.9914	25.8621	16.1638	5.1724
96	20.1461	39.3443	24.4315	11.0259	5.0502
97	26.0870	41.4050	20.3704	8.1924	3.9452
98	20.3435	39.9293	21.9603	11.2833	6.4837

Poll. Dist	13 totpphh	14 peopcoun	15 peoprent	16 peopeph	17 peopoth	18 man-cons	19 prof-man	20 m111
1	537	0	22	0	32	8	29	4
2	849	89	75	0	0	13	47	9
3	3254	2315	43	0	0	43	50	123
4	3033	413	308	0	0	42	118	81
5	4646	3310	183	0	16	65	84	229
6	1445	17	95	0	0	16	61	37
7	1270	79	31	0	0	18	37	52
8	1022	0	67	52	0	5	57	19
9	2869	174	390	15	0	31	95	80
10	1564	142	181	0	8	15	59	48
11	5005	305	509	33	0	53	203	161
12	4212	53	402	38	5	50	232	131
13	1452	96	54	0	0	11	46	54
14	1668	1494	4	0	0	16	4	72
15	3887	725	503	0	0	66	116	143
16	3288	406	147	0	0	30	120	116
17	2477	135	127	62	0	39	68	118
18	2541	111	177	0	0	47	88	109
19	4110	410	142	80	0	57	147	161
20	2354	15	129	0	0	35	91	74
21	1557	35	88	0	0	18	37	67
22	3728	9	205	81	0	41	157	117
23	1807	536	150	0	0	30	43	78
24	3508	21	320	42	0	38	151	97
25	2886	387	917	0	22	25	88	57
26	4685	1095	545	0	0	74	99	186
27	1920	47	223	0	0	16	76	65
28	1374	20	311	0	0	20	20	55
29	462	0	51	27	0	5	46	10
30	3333	2	133	0	0	24	168	51
31	2531	425	91	0	0	29	119	91
32	2168	6	126	0	0	24	119	72
33	3289	301	496	118	10	24	127	89
34	3273	399	612	0	0	33	104	102
35	1827	135	463	33	0	17	51	55
36	1040	9	168	19	0	8	12	31
37	2759	96	201	4	0	23	91	90
38	1634	1120	42	0	0	18	24	77
39	1309	14	179	0	0	23	45	34
40	2120	1092	245	0	0	27	59	57
41	2886	1019	468	0	0	42	48	114
42	2180	200	253	0	0	10	91	52
43	4051	289	795	33	29	38	129	131
44	4080	286	788	42	0	41	122	119
45	3839	68	903	0	0	40	164	92
46	1839	318	237	0	0	25	19	103
47	3691	795	626	83	16	44	107	89
48	2219	16	468	0	0	24	79	45
49	4137	1739	593	71	0	54	87	145
50	2190	516	511	0	0	17	80	60
51	5953	372	1192	39	10	53	237	173
52	2379	27	372	23	0	10	159	31
53	2210	38	736	0	0	28	74	106
54	3023	530	643	7	91	17	118	61
55	2141	88	568	0	0	15	65	45

Poll. Dist	13 totpphh	14 peopcoun	15 peoprent	16 peopeph	17 peopoth	18 man-cons	19 prof-man	20 m111
56	2047	27	385	0	0	17	145	23
57	1580	6	231	0	0	13	108	26
58	1134	2	128	114	22	7	75	15
59	4000	4	619	0	0	28	259	40
60	2544	0	585	0	29	25	147	42
61	4407	17	1571	41	3	26	263	71
62	3146	1439	505	0	0	18	91	80
63	2752	186	486	48	0	22	115	54
64	2028	827	428	0	0	23	25	58
65	4950	83	1163	10	17	34	307	66
66	4569	69	1162	43	21	28	195	104
67	4929	1754	613	0	0	46	96	185
68	3399	1503	433	43	0	42	75	125
69	5324	208	1117	0	0	62	180	189
70	2248	1120	89	0	0	16	38	67
71	1799	19	363	11	25	8	104	33
72	1157	1034	24	0	0	16	9	59
73	876	1	156	0	0	9	58	10
74	4325	445	757	11	18	36	176	135
75	3716	775	703	34	13	37	111	93
76	1628	17	481	15	0	7	75	33
77	4462	550	1168	36	0	42	196	134
78	1175	224	74	0	0	13	30	54
79	4859	423	384	0	0	53	131	207
80	8735	5294	1531	46	0	81	123	351
81	3435	2117	324	56	0	43	19	135
82	1794	1389	5	0	22	22	15	58
83	2968	2082	55	0	0	34	12	103
84	4721	3699	86	8	0	46	20	187
85	2167	137	83	0	0	22	143	31
86	1833	28	413	42	75	14	112	31
87	5851	1408	1819	0	0	53	146	181
88	1655	8	279	0	0	21	53	90
89	2634	144	276	0	0	25	101	87
90	2527	742	125	0	0	27	59	118
91	1310	183	109	0	0	27	60	24
92	1419	314	56	0	0	13	55	35
93	3042	47	497	0	0	24	143	77
94	4947	43	400	0	0	45	183	215
95	470	4	36	52	0	6	14	11
96	3829	1599	161	0	0	30	181	97
97	4966	1600	120	0	0	41	180	163
98	5946	17	888	0	48	50	329	145

Poll. Dist.	manual	ethnic	nocar	sharam	unemploy	density
1	2	256	508	9492	0	0
2	6	301	1706	7933	0	0
3	60	129	3499	2539	0	0
4	29	407	3065	6712	212	76
5	58	449	3941	2621	129	65
6	6	579	2958	9020	91	0
7	13	653	3347	8200	0	21
8	0	233	1519	8743	358	0
9	29	281	3259	7663	204	65
10	3	345	3660	7204	92	15
11	30	798	6160	14521	646	88
12	15	581	1811	8455	108	6
13	4	450	2144	8752	19	0
14	37	312	4740	800	0	34
15	39	445	3451	6483	197	34
16	14	433	1416	8514	53	0
17	34	419	3371	8222	237	21
18	17	534	2065	8409	21	21
19	34	617	2803	8622	6	25
20	17	733	1874	8967	24	0
21	7	736	2444	8872	35	0
22	21	991	1923	9250	125	23
23	7	840	4134	5923	219	68
24	4	534	2081	8737	150	0
25	16	534	2880	4868	214	41
26	59	872	8593	6827	75	189
27	6	1064	2819	7778	546	112
28	23	1466	3710	6521	956	139
29	0	273	472	9340	0	0
30	11	536	1305	9299	117	0
31	14	979	1104	8172	13	27
32	8	755	1425	9346	27	13
33	37	904	3345	6925	228	366
34	31	927	4139	6049	780	128
35	17	1329	4314	6021	293	94
36	10	675	2701	7788	316	0
37	24	1315	3016	8571	39	59
38	14	790	4235	2816	390	53
39	15	2417	2658	8027	225	203
40	30	935	4455	3866	315	92
41	37	967	4391	4549	198	99
42	12	1163	2886	7531	211	37
43	37	2599	8494	12972	680	209
44	30	1636	3755	6688	643	115
45	30	1852	3731	6992	598	177
46	32	2623	3990	6101	245	228
47	67	812	3982	4675	39	66
48	13	1494	4030	6987	810	69
49	83	1449	5079	4019	690	165
50	38	1001	5000	4794	812	97
51	38	2017	6679	13353	1228	245
52	4	820	1800	7899	320	62
53	16	2027	4172	5993	853	327
54	20	1044	3473	5665	618	197
55	11	457	4658	5903	636	19

Poll. Dist.	21 manual	22 ethnic	23 nocar	24 sharam	25 unemploy	26 density
56	11	510	2658	7718	46	11
57	0	393	1566	8200	16	66
58	0	497	536	8833	32	32
59	7	270	2267	7301	740	7
60	12	878	2950	6882	1101	212
61	16	1866	6884	8932	1628	237
62	45	1174	5295	3257	489	107
63	12	896	3184	6954	623	78
64	53	1157	6084	2695	1521	317
65	7	2775	6973	13061	1188	199
66	15	3620	7147	14574	883	188
67	92	2832	7379	13146	432	143
68	73	2271	4984	3456	698	498
69	33	5006	7062	14220	1008	613
70	49	1541	4518	4409	201	158
71	3	1277	2890	7893	77	92
72	17	493	5767	771	23	210
73	3	782	2500	8166	88	29
74	44	2025	6712	14134	535	207
75	40	1023	4543	4584	703	127
76	1	850	3392	6362	541	159
77	50	1497	7839	9085	299	102
78	18	2108	4195	6977	23	204
79	39	5042	6129	15612	348	126
80	125	2330	8821	2238	234	280
81	39	1040	5225	2530	308	150
82	48	200	6212	1682	0	166
83	54	381	5383	2217	91	82
84	90	768	11422	2603	57	116
85	5	384	1356	8961	40	13
86	3	568	3768	5980	467	12
87	63	839	5760	8259	234	25
88	2	1538	2337	8053	151	63
89	20	1060	2842	7928	155	33
90	10	619	2934	6649	64	32
91	12	514	2739	7433	38	0
92	9	296	2273	6894	0	71
93	11	664	2269	7764	319	82
94	25	1463	4377	17560	1117	77
95	5	256	2903	8783	0	85
96	35	679	4946	11639	41	119
97	46	573	2598	6414	112	43
98	21	1525	5798	15872	392	128

Poll. Dist.	27 arth	28 sight	29 circ	30 lungs	31 heart	32 stroke
1	0	0	0	0	0	0
2	4	1	0	0	3	0
3	24	4	0	5	5	5
4	24	5	0	5	9	7
5	11	3	0	4	1	5
6	13	4	0	5	2	1
7	7	1	0	3	1	5
8	7	2	1	1	1	2
9	31	8	0	1	2	7
10	14	3	1	1	3	1
11	30	15	7	4	10	10
12	17	5	0	3	3	6
13	8	2	1	2	3	4
14	16	1	2	7	10	1
15	18	10	3	4	4	2
16	11	4	1	0	3	2
17	18	6	2	3	2	2
18	4	3	1	1	4	4
19	29	11	2	3	7	5
20	14	5	1	3	4	3
21	12	3	1	2	2	0
22	15	8	0	3	5	6
23	4	3	0	3	2	0
24	15	4	1	4	0	3
25	18	3	1	2	7	3
26	50	18	5	15	11	4
27	9	4	1	2	2	1
28	3	0	0	0	0	1
29	1	0	0	0	0	0
30	8	4	1	1	0	4
31	2	0	0	0	1	0
32	8	1	1	1	3	0
33	5	4	2	0	1	1
34	10	3	0	1	2	3
35	19	4	4	3	2	1
36	10	3	1	1	1	2
37	1	0	1	0	0	0
38	9	3	1	3	3	2
39	0	6	0	1	2	4
40	0	0	0	0	0	0
41	12	0	0	0	0	0
42	25	8	1	7	2	0
43	24	9	1	6	3	3
44	28	5	2	8	5	4
45	7	8	0	6	2	6
46	20	1	0	4	3	1
47	18	3	1	7	5	3
48	15	4	2	11	5	2
49	10	7	0	5	9	1
50	33	2	0	6	4	2
51	5	15	1	4	8	6
52	12	2	0	1	1	3
53	13	5	2	1	2	1
54	25	10	2	1	4	5
55	8	4	2	3	5	7

Poll. Dist.	27 arth	28 sight	29 circ	30 lungs	31 heart	32 stroke
56	4	2	0	0	1	1
57	4	1	0	0	0	0
58	11	0	0	0	2	2
59	10	4	1	2	3	2
60	18	5	0	1	3	1
61	13	11	3	6	4	0
62	6	2	0	7	3	0
63	14	3	0	0	2	1
64	8	3	0	2	4	3
65	20	5	1	1	1	3
66	28	9	1	4	2	2
67	23	13	0	14	12	6
68	36	9	0	12	7	4
69	5	18	0	8	11	9
70	7	0	0	4	1	2
71	21	5	0	4	3	4
72	7	7	0	8	4	2
73	35	5	0	4	0	0
74	6	11	0	9	4	5
75	24	7	1	5	4	4
76	64	7	3	7	5	4
77	23	25	5	11	21	13
78	49	8	0	2	5	1
79	48	30	1	12	2	7
80	42	29	0	19	13	13
81	27	15	0	7	4	7
82	51	14	1	15	7	8
83	86	26	2	20	14	12
84	12	41	6	24	30	8
85	15	12	0	2	2	2
86	30	12	1	0	2	2
87	19	18	2	12	8	2
88	21	8	1	3	6	4
89	63	9	1	5	7	9
90	14	21	0	16	11	12
91	8	6	0	3	1	1
92	4	5	2	3	1	3
93	39	3	0	4	3	1
94	1	15	1	13	10	5
95	32	1	0	0	0	0
96	43	19	2	4	12	6
97	46	26	0	11	14	3
98	41	23	2	8	7	10

Poll. Dist.	33 predarth	34 predchst	35 predhert	36 predstrk	37 smrchst	38 smrhert	39 smrstrk
1	3.1219	0.69120	0.80412	0.53289	0.000	0.000	0.000
2	5.2733	1.14692	1.34148	0.89307	0.000	223.633	0.000
3	19.2603	4.19389	4.98635	3.32024	119.221	100.274	150.591
4	20.8079	4.63888	5.04663	3.32822	107.785	178.337	210.322
5	19.9825	4.41300	5.00769	3.33570	90.641	19.969	149.894
6	11.3591	2.52932	2.71642	1.78904	197.681	73.626	55.896
7	9.5560	2.09061	2.23341	1.47931	143.499	44.775	337.996
8	7.3195	1.57646	1.73743	1.15723	63.433	57.556	172.826
9	20.1966	4.52945	4.74822	3.12261	22.078	42.121	224.172
10	12.9663	2.86473	2.96540	1.95501	34.907	101.167	51.151
11	34.6366	7.66297	8.36218	5.52724	52.199	119.586	180.922
12	24.1934	5.23645	5.92527	3.95294	57.291	50.631	151.786
13	9.7901	2.15763	2.38645	1.57961	92.694	125.710	253.227
14	10.3683	2.41265	2.72524	1.77871	290.138	366.940	56.221
15	23.8865	5.34615	5.79519	3.82223	74.820	69.023	52.326
16	17.7024	3.87617	4.62475	3.07836	0.000	64.868	64.970
17	17.7328	3.78685	4.10562	2.74169	79.222	48.714	72.948
18	15.0520	3.41068	3.82159	2.51422	29.320	104.669	159.095
19	30.8842	6.92250	7.55718	4.97133	43.337	92.627	100.577
20	15.1241	3.43967	3.79738	2.49195	87.218	105.336	120.388
21	9.1915	1.99881	2.25360	1.50074	100.060	88.747	0.000
22	24.6966	5.50026	6.06345	4.00225	54.543	82.461	149.916
23	11.4048	2.52022	2.77272	1.83572	119.037	72.131	0.000
24	24.8989	5.48790	6.07999	4.02275	72.888	0.000	74.576
25	15.1811	3.33644	3.64961	2.42527	59.944	191.801	123.698
26	37.0798	8.33519	8.79645	5.77350	179.960	125.050	69.282
27	13.0448	2.87049	3.12221	2.06724	69.674	64.057	48.374
28	6.5633	1.43774	1.62066	1.07996	0.000	0.000	92.596
29	3.1955	0.69388	0.77560	0.51560	0.000	0.000	0.000
30	23.2559	5.15529	5.70000	3.76543	19.398	0.000	106.230
31	9.8460	2.10252	2.59229	1.74642	0.000	38.576	0.000
32	13.5704	3.02573	3.35496	2.21589	33.050	89.420	0.000
33	20.9911	4.61513	5.05611	3.35149	0.000	19.778	29.837
34	25.0715	5.62816	5.99814	3.94110	17.768	33.344	76.121
35	13.7892	3.15707	3.36127	2.19584	95.025	59.501	45.541
36	8.3253	1.84587	1.97640	1.30295	54.175	50.597	153.498
37	18.2443	4.06911	4.46225	2.94381	0.000	0.000	0.000
38	10.1470	2.20324	2.50967	1.67091	136.163	119.538	119.695
39	7.3584	1.60733	1.81293	1.20621	62.215	110.318	331.618
40	11.5478	2.56808	2.90454	1.92362	0.000	0.000	0.000
41	17.4535	3.93002	4.34347	2.86119	0.000	0.000	0.000
42	14.7226	3.19329	3.56498	2.37128	219.210	56.101	0.000
43	25.8454	5.74381	6.14460	4.05848	104.460	48.823	73.919
44	27.1007	6.09842	6.52068	4.28784	131.181	76.679	93.287
45	34.2464	7.52192	7.68106	5.07049	79.767	26.038	118.332
46	9.8899	2.19245	2.39590	1.58795	182.445	125.214	62.974
47	27.6228	6.29889	6.68977	4.37534	111.131	74.741	68.566
48	13.1284	2.93856	3.10707	2.04902	374.333	160.924	97.608
49	26.2195	5.84602	6.11404	4.03258	85.528	147.202	24.798
50	15.1294	3.37599	3.65206	2.40741	177.726	109.527	83.077
51	40.7955	9.07092	9.65307	6.36843	44.097	82.875	94.215
52	16.2994	3.64140	3.94190	2.59752	27.462	25.368	115.495
53	11.6294	2.60449	2.77931	1.83580	38.395	71.960	54.472
54	20.5562	4.59219	4.86718	3.20632	21.776	82.183	155.942
55	27.4663	6.14035	6.05506	3.95930	48.857	82.576	176.799

Poll. Dist.	33 predarth	34 predchst	35 predhert	36 predstrk	37 smrchst	38 smrhert	39 smrstrk
56	16.3850	3.69106	3.83876	2.51680	0.000	26.050	39.733
57	12.7985	2.82558	3.00054	1.98017	0.000	0.000	0.000
58	6.7937	1.47509	1.65480	1.10239	0.000	120.861	181.424
59	26.0545	5.85185	6.41793	4.22703	34.177	46.744	47.315
60	15.8887	3.47093	3.81572	2.53401	28.811	78.622	39.463
61	31.0912	6.92184	7.20361	4.74765	86.682	55.528	0.000
62	25.3615	5.70033	5.96469	3.91372	122.800	50.296	0.000
63	18.9846	4.24080	4.53188	2.98565	0.000	44.132	33.494
64	10.6558	2.37810	2.70837	1.79268	84.101	147.691	167.347
65	36.5858	8.32082	8.72529	5.71141	12.018	11.461	52.526
66	28.3152	6.31503	6.65397	4.39130	63.341	30.057	45.545
67	34.5716	7.57919	8.21766	5.44490	184.716	146.027	110.195
68	14.3523	3.12989	3.58570	2.39800	383.400	195.220	166.805
69	35.3428	7.89024	8.49569	5.60044	101.391	129.477	160.702
70	11.4216	2.47483	2.84168	1.89828	161.627	35.190	105.358
71	12.8597	2.88868	3.11197	2.04627	138.471	96.402	195.477
72	9.3695	2.02318	2.13667	1.41966	395.418	187.207	140.879
73	6.5705	1.47052	1.55577	1.02339	272.012	0.000	0.000
74	26.6914	5.88822	6.48862	4.29900	152.848	61.646	116.306
75	29.0139	6.60144	6.88902	4.50480	75.741	58.063	88.794
76	12.0281	2.69203	2.76779	1.81921	260.027	180.649	219.876
77	35.6946	8.03042	8.48695	5.56890	136.979	247.439	233.439
78	7.8519	1.71248	1.81366	1.20399	116.790	275.685	83.057
79	32.7825	7.21283	7.83536	5.18828	166.370	25.525	134.919
80	23.9917	5.18643	5.98718	4.05281	366.341	217.131	320.765
81	23.9743	5.36762	5.71732	3.76332	130.412	69.963	186.006
82	15.0253	3.30340	3.52363	2.32768	454.077	198.658	343.690
83	24.4095	5.35500	5.74327	3.79727	373.483	243.764	316.016
84	39.8087	8.69252	9.05948	5.99531	276.100	331.145	133.438
85	12.2546	2.68606	3.10338	2.06333	74.458	64.446	96.930
86	17.8874	3.96310	4.01843	2.64183	0.000	49.771	75.705
87	27.5401	6.11567	6.88087	4.56811	196.217	116.264	43.782
88	9.8532	2.20127	2.39475	1.58109	136.285	250.548	252.989
89	20.6398	4.65156	5.03699	3.30578	107.491	138.972	272.250
90	15.3774	3.47347	3.98915	2.62731	460.634	275.748	456.740
91	8.6453	2.00703	2.16013	1.40800	149.474	46.294	71.023
92	7.6764	1.71606	2.06884	1.36936	174.819	48.336	219.080
93	18.8852	4.13157	4.53077	3.00901	96.816	66.214	33.234
94	33.4351	7.42385	7.98928	5.27499	175.111	125.168	94.787
95	3.3968	0.79326	0.87132	0.56661	0.000	0.000	0.000
96	23.4859	5.25604	5.87086	3.87359	76.103	204.399	154.895
97	24.1632	5.33087	6.01934	4.00231	206.345	232.584	74.957
98	41.3626	9.28647	9.92381	6.52709	86.147	70.537	153.208

Poll. Dist.	pred-14	pred-44	pred-64	pred-74	pred75+
1	0.30288	0.07107	0.0099497	0.0013477	2.4088
2	0.46462	0.11343	0.0171735	0.0020334	4.3988
3	1.71437	0.42536	0.0666495	0.0078262	14.9767
4	1.71437	0.42711	0.0492716	0.0079208	19.7944
5	3.74339	0.70648	0.0586761	0.0082045	16.2335
6	0.79984	0.18590	0.0250106	0.0041141	11.4158
7	0.74103	0.17119	0.0207854	0.0029555	10.3685
8	0.64987	0.12463	0.0186046	0.0021753	7.7502
9	1.81729	0.41485	0.0390493	0.0073060	20.8418
10	0.76456	0.22336	0.0234432	0.0039486	14.7673
11	2.63772	0.72293	0.0836868	0.0125314	33.7239
12	2.53480	0.63191	0.0697844	0.0082518	22.7269
13	0.82925	0.18905	0.0251469	0.0035703	9.3212
14	1.05862	0.20375	0.0286907	0.0056509	6.8076
15	2.42306	0.57834	0.0558139	0.0093394	22.3080
16	1.99667	0.43096	0.0621517	0.0075897	12.9868
17	1.50853	0.33923	0.0421841	0.0045870	20.1086
18	1.66438	0.34344	0.0407530	0.0069277	11.8348
19	2.22604	0.52583	0.0736689	0.0122713	28.6967
20	1.42325	0.30878	0.0380270	0.0068568	12.4632
21	0.93217	0.22861	0.0260329	0.0032156	8.5881
22	2.20251	0.50202	0.0622880	0.0096704	22.6222
23	1.08508	0.26502	0.0287588	0.0042086	10.7874
24	1.92610	0.45511	0.0643325	0.0091030	23.6695
25	2.13488	0.42115	0.0376181	0.0053672	14.6625
26	2.64066	0.60600	0.0736689	0.0137845	37.7037
27	1.13507	0.26712	0.0310759	0.0044924	13.0916
28	0.74985	0.23561	0.0188772	0.0024590	5.7603
29	0.23819	0.06162	0.0086549	0.0010640	3.1420
30	1.94962	0.42290	0.0593576	0.0088429	21.6796
31	1.78495	0.38264	0.0392537	0.0039722	6.8076
32	1.40561	0.30002	0.0352329	0.0054618	12.0442
33	1.47030	0.53528	0.0523383	0.0073297	20.5276
34	1.44678	0.48417	0.0530879	0.0094576	24.8216
35	0.71751	0.28182	0.0286907	0.0059583	12.5679
36	0.49696	0.14038	0.0181276	0.0028346	8.5881
37	1.49383	0.39175	0.0449782	0.0071169	16.8619
38	0.93217	0.22371	0.0298492	0.0035939	9.3212
39	0.72927	0.19780	0.0209217	0.0026718	6.7029
40	1.27622	0.31858	0.0330522	0.0048234	9.5307
41	1.50853	0.44461	0.0447738	0.0074479	14.8720
42	1.15860	0.29547	0.0397308	0.0048470	14.5578
43	2.09371	0.66061	0.0569724	0.0092212	25.8689
44	1.98785	0.63681	0.0588124	0.0105689	25.9737
45	1.84082	0.59690	0.0573132	0.0094340	41.0551
46	1.13213	0.30353	0.0244654	0.0037121	9.2165
47	2.09665	0.49432	0.0564272	0.0115856	25.8689
48	1.23799	0.36969	0.0271914	0.0048234	13.0916
49	2.60831	0.64451	0.0507709	0.0090557	27.5446
50	0.95276	0.34554	0.0350285	0.0056982	14.5578
51	3.17585	0.91058	0.0868216	0.0143520	41.6835
52	1.31445	0.33503	0.0376181	0.0062184	15.6051
53	1.15272	0.39490	0.0256240	0.0044214	11.1016
54	1.63203	0.46211	0.0426612	0.0074242	20.8418
55	0.97334	0.25066	0.0335974	0.0078971	34.2475

Poll. Dist.	40 pred-14	41 pred-44	42 pred-64	43 pred-74	44 pred75+
56	1.12919	0.28007	0.0298492	0.0059583	17.1761
57	0.83513	0.20865	0.0267143	0.0041850	13.7200
58	0.75573	0.16209	0.0188091	0.0023171	6.4934
59	2.40541	0.57099	0.0640599	0.0107108	23.2506
60	1.18800	0.38790	0.0402760	0.0053199	15.8146
61	2.30543	0.72118	0.0584717	0.0103798	33.5144
62	1.56440	0.44216	0.0481131	0.0091975	26.3926
63	1.49971	0.40890	0.0410937	0.0069986	18.8518
64	1.08802	0.31648	0.0314848	0.0046342	8.3786
65	3.14350	0.70122	0.0697162	0.0146593	35.8185
66	2.90532	0.73833	0.0573813	0.0100251	29.0109
67	2.85239	0.68197	0.0811652	0.0114201	35.6090
68	2.34366	0.55979	0.0442286	0.0055091	11.9395
69	2.79063	0.78910	0.0797341	0.0132407	34.3523
70	1.51441	0.32978	0.0350285	0.0041377	10.0543
71	1.03509	0.24436	0.0287588	0.0050362	12.2537
72	0.79690	0.13688	0.0192180	0.0024590	10.9969
73	0.52931	0.12288	0.0133572	0.0023881	6.7029
74	2.38777	0.66026	0.0680807	0.0097650	25.2405
75	1.94374	0.53423	0.0536331	0.0114674	28.9062
76	0.89100	0.24576	0.0207172	0.0040431	13.1963
77	2.22898	0.61055	0.0716244	0.0133825	36.0280
78	0.68222	0.18310	0.0165602	0.0023171	8.6928
79	2.65242	0.70683	0.0778259	0.0112309	32.9907
80	7.82200	1.51868	0.0786437	0.0093394	18.2235
81	2.40247	0.44636	0.0504983	0.0089375	23.8790
82	1.05274	0.20970	0.0320299	0.0047997	16.2335
83	1.63498	0.35639	0.0537013	0.0077789	26.1831
84	3.13468	0.57974	0.0751682	0.0111364	46.5012
85	1.34091	0.29757	0.0381633	0.0048707	10.1591
86	0.83219	0.24541	0.0279410	0.0052017	21.3654
87	4.40502	0.86681	0.0774852	0.0113964	22.8317
88	0.76162	0.28392	0.0237158	0.0038303	9.1117
89	1.15566	0.35079	0.0471590	0.0083227	19.2708
90	1.38796	0.34273	0.0463412	0.0073060	11.2064
91	0.74397	0.19220	0.0189454	0.0042086	7.0171
92	0.78220	0.18450	0.0279410	0.0038303	4.7130
93	1.72613	0.46807	0.0472953	0.0063839	18.7471
94	2.88767	0.71523	0.0753044	0.0120112	33.3049
95	0.22937	0.05846	0.0081779	0.0017733	2.5136
96	2.24074	0.52093	0.0629695	0.0098596	20.0039
97	3.81102	0.72013	0.0689666	0.0096231	20.5276
98	3.55225	0.83006	0.0888661	0.0158415	40.3220

Poll. Dist.	45 predcc14	46 predcc64	47 predcc74	48 predcc75	49 prdoth14	50 prdoth64	51 prdoth74
1	0.00000	0.0000	0.0000	0.0000	0.27164	1.7595	2.0106
2	0.05163	0.9907	1.0357	0.1915	0.38504	2.6065	2.4338
3	1.72946	23.8783	20.1656	21.8312	0.47735	3.8871	-1.6226
4	0.31406	3.6439	5.4222	6.5111	1.34501	8.7019	8.6771
5	4.27203	32.3248	17.3631	20.4907	0.73844	4.8097	2.1869
6	0.00430	0.1847	0.1828	0.3830	0.71470	4.4720	6.0317
7	0.01291	0.2855	1.7668	5.7450	0.65668	3.9174	3.3862
8	0.00000	0.0000	0.0000	0.0000	0.58284	3.1712	3.2451
9	0.24092	1.8303	0.3046	0.7660	1.48215	8.3137	10.7230
10	0.10755	1.2258	1.8277	2.6810	0.61976	4.5829	4.8324
11	0.13337	2.7875	4.2646	7.2771	2.28388	15.7653	16.2255
12	0.01721	0.5206	0.7920	0.9575	2.26278	14.1066	11.8517
13	0.10325	0.7221	1.3403	1.3405	0.68042	4.3661	4.5502
14	1.40250	13.7527	14.5607	12.2561	0.08967	0.9277	-1.6226
15	0.70555	6.4314	7.4326	10.7241	1.74060	10.5270	9.6295
16	0.30975	5.0376	2.0105	0.1915	1.60082	9.2918	10.1586
17	0.08604	0.9068	2.1932	4.7875	1.30018	7.7339	5.5731
18	0.09034	1.2426	0.8529	0.3830	1.43731	7.5877	9.8411
19	0.24522	3.8118	6.0314	5.1705	1.84609	11.8781	14.8146
20	0.02151	0.1175	0.1828	0.0000	1.26325	7.2247	10.1233
21	0.04302	0.2687	0.5483	0.0000	0.80964	5.1374	4.4797
22	0.00000	0.0840	0.0609	0.5745	1.97532	11.8126	14.3913
23	0.54637	4.9705	4.3865	7.8516	0.63822	4.4518	3.7389
24	0.01721	0.2351	0.1828	0.0000	1.71686	11.2429	13.4742
25	0.25383	3.1233	5.7268	9.1921	1.75906	7.9104	4.6913
26	0.98949	9.9409	11.0880	17.4266	1.76170	11.1925	14.1444
27	0.01291	0.3526	1.1575	0.7660	1.01008	6.0399	6.0317
28	0.03011	0.2015	0.0609	0.0000	0.65404	4.7291	3.6331
29	0.00000	0.0000	0.0000	0.0000	0.21362	1.5276	1.5873
30	0.00000	0.0168	0.0609	0.0000	1.74851	10.4766	13.1568
31	0.58079	4.4499	1.2185	0.9575	1.24479	7.0785	5.2204
32	0.01291	0.0504	0.0000	0.0000	1.25270	6.9121	8.1480
33	0.26673	3.0730	2.0105	4.4045	1.15513	10.6581	9.7706
34	0.24952	3.5431	5.6659	7.0856	1.14458	9.8363	10.8288
35	0.12476	1.1251	1.4012	3.0640	0.56701	5.8433	8.0775
36	0.00000	0.0168	0.4874	0.0000	0.44570	3.3577	4.0211
37	0.03442	0.6213	2.4979	1.9150	1.31864	8.7826	9.1709
38	0.97659	11.2003	9.2603	13.0221	0.23735	2.0671	-0.2116
39	0.01291	0.1175	0.0609	0.5745	0.64613	4.3610	3.9506
40	1.14007	10.5622	9.6259	7.6601	0.44570	3.8619	1.6226
41	0.98519	10.1424	8.8339	7.8516	0.74899	6.6701	5.9964
42	0.24522	1.5785	2.0714	2.8725	0.88876	6.7205	6.0317
43	0.21941	2.9386	2.5588	4.0215	1.74324	12.8461	12.2750
44	0.21080	2.6699	3.7163	3.2555	1.65357	12.7201	13.6153
45	0.06453	0.7221	0.3655	0.7660	1.61137	12.6193	13.8622
46	0.36138	2.8882	2.8025	3.0640	0.79382	5.3139	3.9153
47	0.77008	7.9930	7.1280	4.4045	1.40830	8.8935	13.1568
48	0.00430	0.0504	0.3655	1.1490	1.10765	7.3205	6.9840
49	2.14247	16.6913	10.6616	13.7881	1.02590	8.0263	7.3368
50	0.32696	5.3231	5.2394	7.0856	0.65404	5.9693	5.4673
51	0.21941	3.2241	4.8739	9.3836	2.71375	18.5684	18.5888
52	0.03011	0.3358	0.0000	0.0000	1.16040	7.5070	9.2768
53	0.03011	0.4702	0.0609	0.3830	1.01535	7.4415	6.5608
54	0.40870	5.0880	5.5440	7.8516	1.21315	8.2834	7.8658
55	0.05593	0.6549	0.8529	4.2130	0.83865	5.8987	11.2873

Poll. Dist.	45 predcc14	46 predcc64	47 predcc74	48 predcc75	49 prdoth14	50 prdoth64	51 prdoth74
56	0.03011	0.3358	0.0000	0.0000	0.99425	6.1407	8.8888
57	0.00000	0.1008	0.0000	0.0000	0.74899	4.9509	6.2433
58	0.00000	0.0336	0.0000	0.0000	0.67778	3.7157	3.4567
59	0.00000	0.0168	0.0609	0.3830	2.15729	12.9571	15.9433
60	0.00000	0.0000	0.0000	0.0000	1.06546	8.5658	7.9364
61	0.00860	0.1847	0.1218	0.3830	2.06235	14.6561	15.4142
62	0.93787	13.5512	16.6930	26.8102	0.82810	5.8584	4.0564
63	0.19360	1.7296	1.7059	1.9150	1.22633	8.4095	9.4531
64	0.68404	8.1610	8.2246	9.0006	0.55646	4.4367	2.1516
65	0.07314	0.3526	2.0714	2.1065	2.77441	15.1502	20.6699
66	0.09034	0.7556	0.1828	0.0000	2.55024	14.6511	14.8499
67	1.66923	17.1783	14.8653	18.9587	1.53489	10.6681	8.4302
68	1.69935	14.5755	10.3570	13.4051	1.06018	6.9575	2.2222
69	0.12906	1.7128	2.7415	5.9365	2.42365	16.7484	18.1655
70	1.20890	10.8141	8.5293	10.5326	0.61712	4.0938	1.2346
71	0.02151	0.1847	0.0609	0.3830	0.91513	5.5912	7.4778
72	0.98949	9.4539	6.3360	18.7672	0.10813	0.5546	-1.3756
73	0.00000	0.0000	0.0609	0.0000	0.47471	2.7578	3.5273
74	0.70985	4.2316	1.2794	1.3405	1.70632	13.2747	13.8270
75	0.36138	6.0955	13.2813	21.0652	1.52171	9.8312	9.4179
76	0.03011	0.1679	0.0000	0.0000	0.78063	5.0215	6.0317
77	0.33557	4.9705	7.7373	9.3836	1.79335	12.5991	15.4848
78	0.17639	2.0318	2.1932	4.9790	0.50372	3.2519	2.1869
79	0.35278	3.8118	4.9348	6.3196	2.16256	14.7922	13.8975
80	7.21469	51.9715	23.6382	25.6612	2.59244	12.0849	0.2469
81	2.45222	17.9675	19.2518	30.8318	0.65141	4.7694	2.1869
82	1.05833	12.3926	12.3674	27.9592	0.29537	1.6688	-1.9753
83	1.43692	18.7736	20.0438	44.8114	0.58547	3.4687	-2.3633
84	3.37288	32.4759	28.6949	81.1967	0.74371	4.1594	-3.0335
85	0.10755	1.3937	1.1575	1.9150	1.13666	6.6903	6.5960
86	0.00000	0.1175	0.5483	2.2980	0.74635	5.5660	7.4426
87	1.21751	13.7191	14.0124	14.9371	3.20429	14.0965	8.8888
88	0.03872	0.0000	0.1218	0.1915	0.65932	5.8433	5.6437
89	0.04302	1.2258	2.4979	3.8300	1.01008	8.1725	10.9699
90	0.53777	7.7747	7.6763	5.3620	0.91513	6.0298	6.4549
91	0.10325	1.7128	2.6806	2.4895	0.60394	3.6552	4.7266
92	0.20650	3.6439	2.8025	0.5745	0.57493	3.6300	4.0917
93	0.07744	0.4198	0.2437	0.0000	1.50061	10.1136	9.3826
94	0.07314	0.3023	0.2437	0.7660	2.54497	15.7804	17.7775
95	0.00860	0.0336	0.0000	0.0000	0.20043	1.4369	2.6455
96	1.17018	16.4395	16.5711	14.5541	1.29226	7.2247	5.1146
97	1.94457	15.5663	9.6259	12.0646	2.22586	10.7992	8.7829
98	0.02151	0.2015	0.0000	0.0000	3.17264	18.4676	23.6328

Poll. Dist.	52 predno.	53 predten	54 shelt
1	2.7941	5.943	0
2	4.9960	11.083	0
3	17.1909	72.743	0
4	21.9931	47.425	0
5	20.7503	86.153	0
6	12.4307	20.816	0
7	11.3045	21.473	0
8	8.5455	13.115	0
9	23.1203	39.776	0
10	15.7826	26.373	0
11	37.1807	72.203	2
12	25.9717	48.029	0
13	10.3682	19.880	0
14	8.1043	41.449	0
15	25.3746	60.166	0
16	15.4842	38.766	0
17	22.0032	36.382	0
18	13.8903	30.609	0
19	31.5345	64.211	0
20	14.2401	28.768	1
21	9.7781	18.064	0
22	25.3987	46.502	0
23	12.1705	31.708	0
24	26.1242	45.547	0
25	17.2616	40.260	0
26	41.0378	88.775	2
27	14.5293	25.371	0
28	6.7671	13.854	0
29	3.4515	5.808	0
30	24.1203	42.567	0
31	9.0184	25.709	0
32	13.7906	25.880	0
33	22.5928	45.636	0
34	26.8151	54.883	0
35	13.6019	28.798	0
36	9.2464	15.106	0
37	18.7996	36.820	0
38	10.5105	38.288	0
39	7.6535	14.765	0
40	11.1633	39.133	0
41	16.8774	49.576	0
42	16.0565	30.656	0
43	28.6894	55.280	0
44	28.6677	56.933	0
45	43.5596	62.077	0
46	10.6803	25.090	0
47	28.5279	62.267	0
48	14.7313	26.816	0
49	30.8573	75.458	0
50	15.8968	38.495	0
51	45.8711	86.415	1
52	17.2985	30.624	0
53	12.6793	24.557	0
54	22.9860	49.313	0
55	35.5130	49.008	10

Poll. Dist.	52 predno.	53 predten	54 shelt
56	18.6212	29.943	0
57	14.7946	22.870	0
58	7.4324	13.008	0
59	26.3018	49.700	1
60	17.4361	30.047	0
61	36.6099	59.112	0
62	28.4565	77.991	0
63	20.8085	38.683	0
64	9.8192	35.942	0
65	39.7476	70.554	0
66	32.7220	55.973	0
67	39.2360	93.222	0
68	14.8927	53.913	4
69	38.0250	72.403	3
70	11.9377	40.419	0
71	13.5669	24.138	2
72	11.9524	35.412	0
73	7.3708	12.110	0
74	28.3664	55.708	0
75	31.4492	75.293	1
76	14.3578	22.445	0
77	38.9525	76.684	13
78	9.5770	20.034	0
79	36.4390	69.577	0
80	27.6521	126.716	11
81	26.7873	83.648	0
82	17.5328	54.510	0
83	28.2360	88.079	6
84	50.3020	149.263	8
85	11.8406	26.187	0
86	22.4762	32.587	0
87	28.1924	81.646	6
88	10.1848	19.606	0
89	20.8327	41.303	0
90	12.9907	41.280	4
91	7.9764	20.435	0
92	5.7114	18.995	0
93	20.9950	36.531	0
94	36.9951	63.438	0
95	2.8114	6.308	0
96	22.8384	71.871	1
97	25.1373	72.001	6
98	44.8090	77.314	3

Appendix8 : Overlay of ward and polling district boundries

THE LONDON BOROUGH OF BARNET